SYSTEMATIC REVISION OF THE NORTH AMERICAN SYNTROPINE VAEJOVID SCORPIONS WITH A SUBACULEAR TUBERCLE, *KONETONTLI* GONZÁLEZ-SANTILLÁN AND PRENDINI, 2013

EDMUNDO GONZÁLEZ-SANTILLÁN

City University of New York;
Scorpion Systematics Research Group,
Division of Invertebrate Zoology,
American Museum of Natural History;
Laboratorio Nacional de Genómica para la Biodiversidad,
Centro de Investigación y de Estudios Avanzados del IPN,
Irapuato, Guanajuato, Mexico
Facultad de Ciencias, Departamento de Biología Comparada,
Universidad Nacional Autonóma de México, Mexico City

LORENZO PRENDINI

Scorpion Systematics Research Group,
Division of Invertebrate Zoology,
American Museum of Natural History

BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY
Number 397, 78 pp., 36 figures, 5 tables
Issued September 24, 2015

Copyright © American Museum of Natural History 2015 ISSN 0003-0090

CONTENTS

Abstract 3
Introduction 3
On the Subaculear Tubercle 3
Taxonomic History of Vaejovidae with a Subaculear Tubercle 5
Material and Methods 9
Systematics 12
Konetontli González-Santillán and Prendini, 2013 12
Key to Identification of the Species of *Konetontli* 14
Konetontli acapulco (Armas and Martín-Frías, 2001) 15
Konetontli chamelaensis (Williams, 1986) 29
Konetontli ignes, sp. nov. 34
Konetontli ilitchi, sp. nov. 39
Konetontli juxtlahuaca, sp. nov. 43
Konetontli kuarapu (Francke and Ponce-Saavedra, 2005) 48
Konetontli migrus, sp. nov. 53
Konetontli nayarit (Armas and Martín-Frías, 2001) 59
Konetontli pattersoni (Williams and Haradon, 1980) 64
Konetontli zihuatanejensis (Baldazo-Monsivaiz, 2003), comb. nov. 71
Acknowledgments 76
References 77

ABSTRACT

The Mexican vaejovid scorpion genus *Konentontli* González-Santillán and Prendini, 2013, was created to accommodate five species united, among other characters, by a subaculear tubercle on the telson. Species of *Konetontli* are among the smallest vaejovid scorpions. Their very small size, cryptic coloration, and apparently seasonal surface activity may explain their rarity in collections and it is likely that more undescribed species await discovery. In the present contribution, we describe four new species (*Konetontli ignes*, sp. nov.; *Konetontli ilitchi*, sp. nov.; *Konetontli juxtlahuaca*, sp. nov.; *Konetontli migrus*, sp. nov.) and revalidate *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., previously synonymized with *Konetontli acapulco* (Armas and Martín-Frías, 2001), raising to 10 the number of species in the genus; redescribe previously described species, including the first description of the female of *Konetontli nayarit* (Armas and Martín-Frías, 2001); and present new records, comprehensive distribution maps, and a key to the identification of the species.

INTRODUCTION

The Mexican vaejovid scorpion genus *Konetontli* González-Santillán and Prendini, 2013, was created to accommodate five species united, among other characters, by a subaculear tubercle on the telson, an uncommon character among vaejovid scorpions. Only nine vaejovid species (one in synonymy) with a conspicuous subaculear tubercle have been previously described (Haradon, 1974; Williams, 1980, 1986; Sissom, 1993; Armas and Martín-Frías, 2001; Baldazo-Monsivaiz, 2003; Francke and Ponce-Saavedra, 2005; Webber et al., 2012). The subaculear tubercle was suggested as a potential diagnostic synapomorphy for these species (Armas and Martín-Frías, 2001). However, phylogenetic analysis (González-Santillán and Prendini, 2015) demonstrated that they do not form a monophyletic group and the subaculear tubercle evolved on multiple independent occasions in Vaejovidae Thorell, 1876. The monophyletic group of five species assigned to *Konetontli* by González-Santillán and Prendini (2013) was not monophyletic with other vaejovids possessing a subaculear tubercle, i.e., the exemplar species of the *mexicanus* group of *Vaejovis* C.L. Koch, 1836, and *Wernerius* Soleglad and Fet, 2008, included in the analyses of González-Santillán and Prendini (2015). Their placement in the *mexicanus* group (Sissom, 2000) and subsequently in Vaejovinae Thorell, 1876 sensu Soleglad and Fet (2008) was falsified and a new genus, *Konetontli*, justified on the basis of their phylogenetic position and unique, diagnostic character combination.

Species of *Konetontli* are among the smallest vaejovid scorpions with adults ranging from 14 to 25 mm in length. The very small size, cryptic coloration, and apparently seasonal surface activity (Williams, 1986; González-Santillán, 2004) of these scorpions may explain their rarity in collections and it is likely that more undescribed species await discovery. In the present contribution, we describe four new species (*Konetontli ignes*, sp. nov.; *Konetontli ilitchi*, sp. nov.; *Konetontli juxtlahuaca*, sp. nov.; *Konetontli migrus*, sp. nov.) and revalidate *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., synonymized with *Konetontli acapulco* (Armas and Martín-Frías, 2001) by Francke and Ponce-Saavedra (2005), raising to 10 the number of species in the genus (table 1); redescribe previously described species, including the first description of the female of *Konetontli nayarit* (Armas and Martín-Frías, 2001); and present new records, comprehensive distribution maps, and a key to the identification of the species.

ON THE SUBACULEAR TUBERCLE

The subaculear tubercle of the telson vesicle is a well-known diagnostic character that evolved independently in three scorpion families. Among Scorpionoidea Latreille, 1802, a conical, broad-based, and distally rounded subaculear tubercle, densely covered with macro- or microsetae, occurs in all species of Diplocentridae Karsch, 1880, and is synapomorphic for the family (Prendini, 2000).

The subaculear tubercle evolved independently on many occasions among Buthidae

Fig. 1. *Konetontli acapulco* (Armas and Martín-Frías, 2001), adult female from Cumbres de Llano Largo, Guerrero, Mexico, habitus in life.

C.L Koch, 1837, although the precise number of derivations remains to be determined. It is observed in most New World species, e.g., in genera *Centruroides* Marx, 1890, *Microtityus* Kjellesvig-Waering, 1966, and *Tityus* C.L Koch, 1836, and many Old World species, e.g., in genera *Isometrus* Ehrenberg, 1828, *Lychas* C.L. Koch, 1845, and *Tityobuthus* Pocock, 1893, and may vary considerably in shape and size (Sissom, 1990: 38, fig. 3.10).

Among Chactoidea Pocock, 1893, only 13 described vaejovids, including four new species described below, exhibit a well-developed subaculear tubercle: *Konetontli acapulco* (Armas and Martín-Frías, 2001); *Konetontli chamelaensis* (Williams, 1986); *Konetontli ignes*, sp. nov.; *Konetontli ilitchi*, sp. nov.; *Konetontli juxtlahuaca*, sp. nov.; *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005); *Konetontli migrus*, sp. nov.; *Konetontli nayarit* (Armas and Martín-Frías, 2001); *Konetontli pattersoni* (Williams and Haradon, 1980); *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov.; *Wernerius inyoensis* Webber et al., 2012; *Wernerius mumai* (Sissom, 1993); *Wernerius spicatus* (Haradon, 1974).

The subaculear tubercle was previously suggested as a potential diagnostic synapomorphy for the vaejovids that possessed it (Armas and Martín-Frías, 2001). However, closer examination revealed at least two character states (González-Santillán and Prendini, 2015): a conical tubercle with a sharp tip in *Wernerius* and a laterally compressed tubercle with a rounded tip in other taxa. These tubercles may be associated with smaller granules, forming a compound subaculear tubercle.

TABLE 1
Currently Recognized Species of the Scorpion Genus *Konetontli* González-Santillán and Prendini, 2013, With Mexican States in Which They Have Been Recorded, and Number of Known Locality Records

Species	State	Localities
Konetontli acapulco (Armas and Martín-Frías, 2001)	Guerrero	7
Konetontli chamelaensis (Williams, 1986)	Jalisco	1
Konetontli ignes, sp. nov.	Guerrero	1
Konetontli ilitchi, sp. nov.	Colima	1
Konetontli juxtlahuaca, sp. nov.	Guerrero	4
Konetontli kuarapu (Francke and Ponce-Saavedra, 2005)	Michoacán	2
Konetontli migrus, sp. nov.	Guerrero	1
Konetontli nayarit (Armas and Martín-Frías, 2001)	Nayarit	2
Konetontli pattersoni (Williams and Haradon, 1980)	Baja California Sur	1
Konetontli zihuatanejensis (Baldazo-Monsivaiz, 2003), comb. nov.	Guerrero	4

Additional states may exist in other vaejovid taxa. For example, Hughes (2011) noted the presence of one or more low subaculear tubercles in *Serradigitus joshuaensis* (Soleglad, 1972) and in *Vaejovis cashi* Graham, 2007, *Vaejovis deboerae* Ayrey, 2009, and *Vaejovis electrum* Hughes, 2011, of the *vorhiesi* complex of *Vaejovis*. The tubercles of these taxa are much less developed than in *Konetontli* and *Wernerius*, however. A small subaculear tubercle was also reported in an undescribed species of *Vaejovis* by González-Santillán and Prendini (2015).

Given the diverse taxa in which a subaculear tubercle has been observed, and the range of character states it exhibits, it is unsurprising that the tubercle is not synapomorphic for the vaejovids that possess it. The phylogenetic positions of taxa with subaculear tubercles imply multiple independent derivations within the family: two in the *mexicanus* group (*Vaejovis* sp.) and the *vorhiesi* complex (*V. cashi*, *V. deboerae* and *V. electrum*); two within Stahnkeini Soleglad and Fet, 2008 (*Wernerius* and *S. joshuaensis*); and one within Syntropinae Kraepelin, 1905 (*Konetontli*).

TAXONOMIC HISTORY OF VAEJOVIDAE WITH A SUBACULEAR TUBERCLE

Vaejovis spicatus Haradon, 1974, the first vaejovid with a subaculear tubercle, was described from California, but not assigned to a species group of *Vaejovis*. *Vaejovis pattersoni* Williams and Haradon, 1980, the second vaejovid with a subaculear tubercle, was described from Baja California Sur, Mexico, and assigned to the *eusthenura* group, earlier diagnosed by Williams (1970a, 1970b). When the third vaejovid with a subaculear tubercle, *Vaejovis chamelaensis* Williams, 1986, was described from Jalisco, Mexico, Williams (1986: 358) remarked that it "appears to belong to the *eusthenura* group of *Vaejovis*, but has no known close relatives." Williams (1986) neglected to compare *V. chamelaensis* with *V. pattersoni*, although the two species differed from all other vaejovids known at the time in sharing a subaculear tubercle, trichobothria *it* and *ib* situated basally on the pedipalp chela finger, moderately to well-developed granular ventrolateral carinae on metasomal segments I–V, small size, and similarly infuscate integument.

Vaejovis mumai Sissom, 1993, the fourth vaejovid with a subaculear tubercle, was described from Arizona. Although neglecting to compare *V. mumai* to the other known vaejovids possessing a subaculear tubercle, i.e., *V. chamelaensis* and *V. pattersoni*, Sissom (1993: 68) noted characters of the hemispermatophore, pectinal teeth of the females, and relative positions of pedipalp chela trichobothria *ib* and *it* that potentially associated *V. mumai* with *V. spicatus*, and both species with *Serradigitus* Stahnke, 1974:

> *Vaejovis spicatus* and *Vaejovis mumai* seem more properly allied to *Serradigitus* (but not

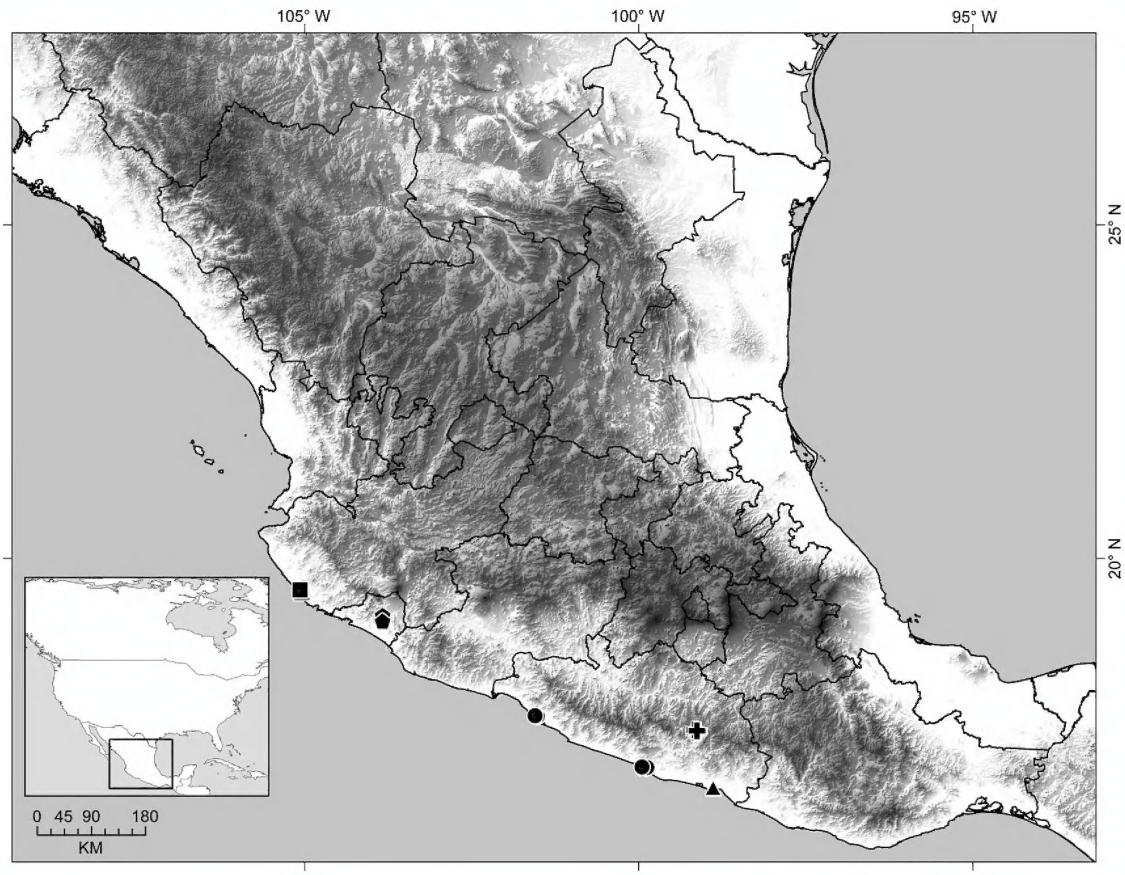

Fig. 2. Map of central Mexico, plotting known locality records for five species in the vaejovid scorpion genus *Konetontli* González-Santillán and Prendini, 2013, based on data collected in the present study: *Konetontli acapulco* (Armas and Martín-Frías, 2001) (circles), *Konetontli chamelaensis* (Williams, 1986) (square), *Konetontli ignes*, n. sp. (triangle), *Konetontli ilitchi*, n. sp. (pentagons), and *Konetontli juxtlahuaca*, n. sp. (cross).

included therein).... First, the presence of a flange along the ental margin of the distal lamina bearing a distally positioned bilobed termination is shared between *V. spicatus* and *Serradigitus*, as well as with several other vaejovid groups (*Syntropis macrura*, and species of the *Vaejovis eusthenura*, *punctipalpi*, and *intrepidus* groups)... Second, the proximal pectinal tooth on each side in the female (of *V. mumai*, at least) is ovoid and lacks peg sensilla, a feature previously thought to occur only in *Serradigitus* (Sissom and Stockwell 1991). And third, although fixed finger trichobothria *ib* and *it* are not positioned at the sixth inner accessory denticle or beyond (a character uniting all *Serradigitus* spp.), they occupy a subproximal position midway between the extreme base of the finger and the sixth inner accessory denticle. In this respect, they differ from members of the *V. nitidulus* and *V. mexicanus* groups, in which the trichobothria are at the extreme base of the finger.

Sissom (2000: 542) placed *V. mumai* and *V. spicatus* incertae sedis within *Vaejovis* and transferred *V. pattersoni* from the *eusthenura* group of *Vaejovis* to the *mexicanus* group noting that "examination of a topoparatype has revealed that is closely related to the members of the *mexicanus* group (e.g., *V. granulatus* Pocock) from mainland Mexico." *Vaejovis chamelaensis* remained in the *eusthenura* group, however. Lourenço and Sissom (2000) subsequently listed *V. pattersoni* in the *mexicanus* group.

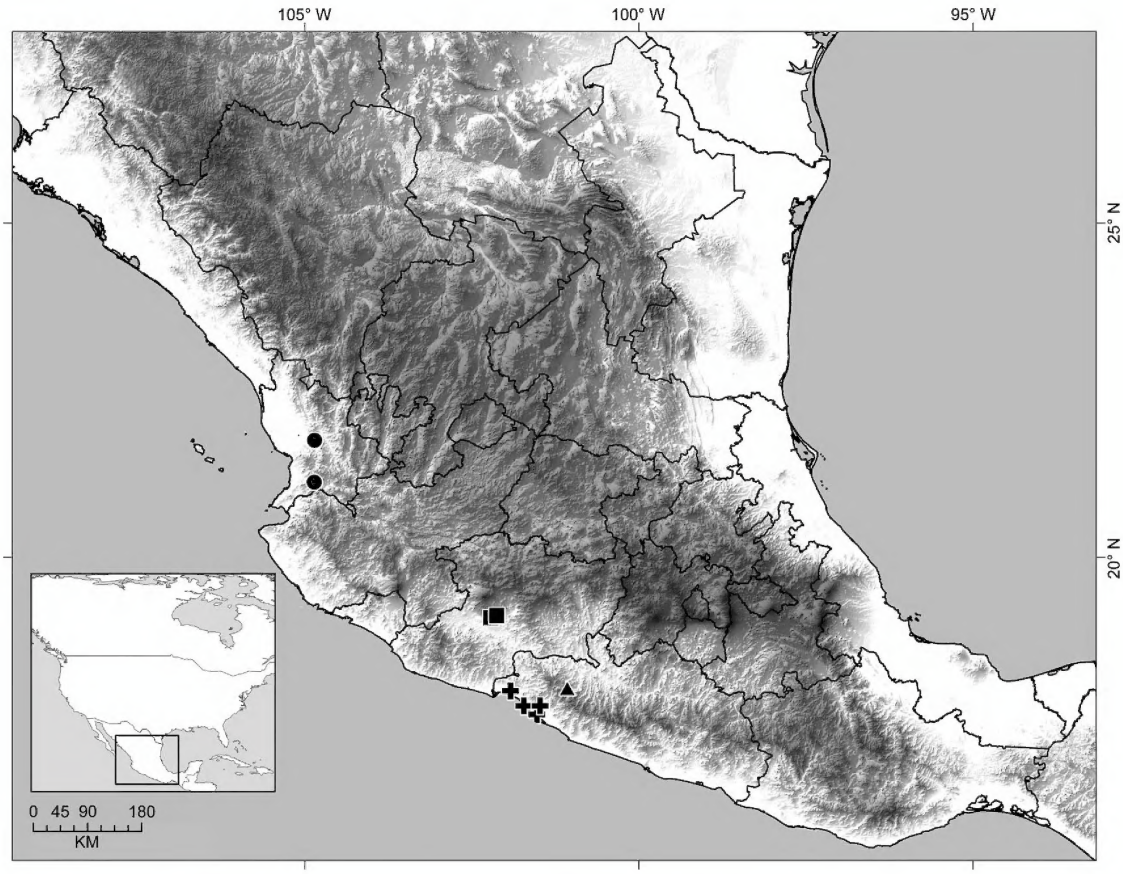

Fig. 3. Map of central Mexico, plotting known locality records for four species in the vaejovid scorpion genus *Konetontli* González-Santillán and Prendini, 2013, based on data collected in the present study: *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2004) (squares), *Konetontli migrus*, n. sp. (triangle), *Konetontli nayarit* (Armas and Martín-Frías, 2001) (circles), and *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov. (crosses).

Armas and Martín-Frías (2001) meanwhile described another two vaejovids with a subaculear tubercle: *Vaejovis acapulco* Armas and Martín-Frías, 2001, from Guerrero, Mexico, and *Vaejovis nayarit* Armas and Martín-Frías, 2001, from Nayarit, Mexico. Despite Sissom's (1993) suggestion that *V. mumai* and *V. spicatus* might be related to *Serradigitus*, Armas and Martín-Frías (2001: 15) proposed that their new species could "represent an independent group" with *V. mumai* and *V. spicatus*. However, Armas and Martín-Frías (2001) neglected to compare *V. acapulco* and *V. nayarit* to the other two Mexican vaejovids possessing a subaculear tubercle, i.e., *V. chamelaensis* and *V. pattersoni*, with which they share several other unique characters, including infuscation extending over the entire surface of the carapace and sternites, metasomal segments I–III width greater than length, pedipalp chela trichobothrium *it* situated between the sixth retrolateral denticle and the macroseta situated at the position of seventh retrolateral denticle (which is absent), and trichobothrium *ib* situated proximal to the macroseta at the position of the seventh retrolateral denticle.

Vaejovis zihuatanejensis Baldazo-Monsivaiz, 2003, the seventh vaejovid with a subaculear tubercle, was also described from Guerrero, Mexico. Baldazo-Monsivaiz (2003) neither provided a diagnosis nor compared *V. zihuatanejensis* with the previously

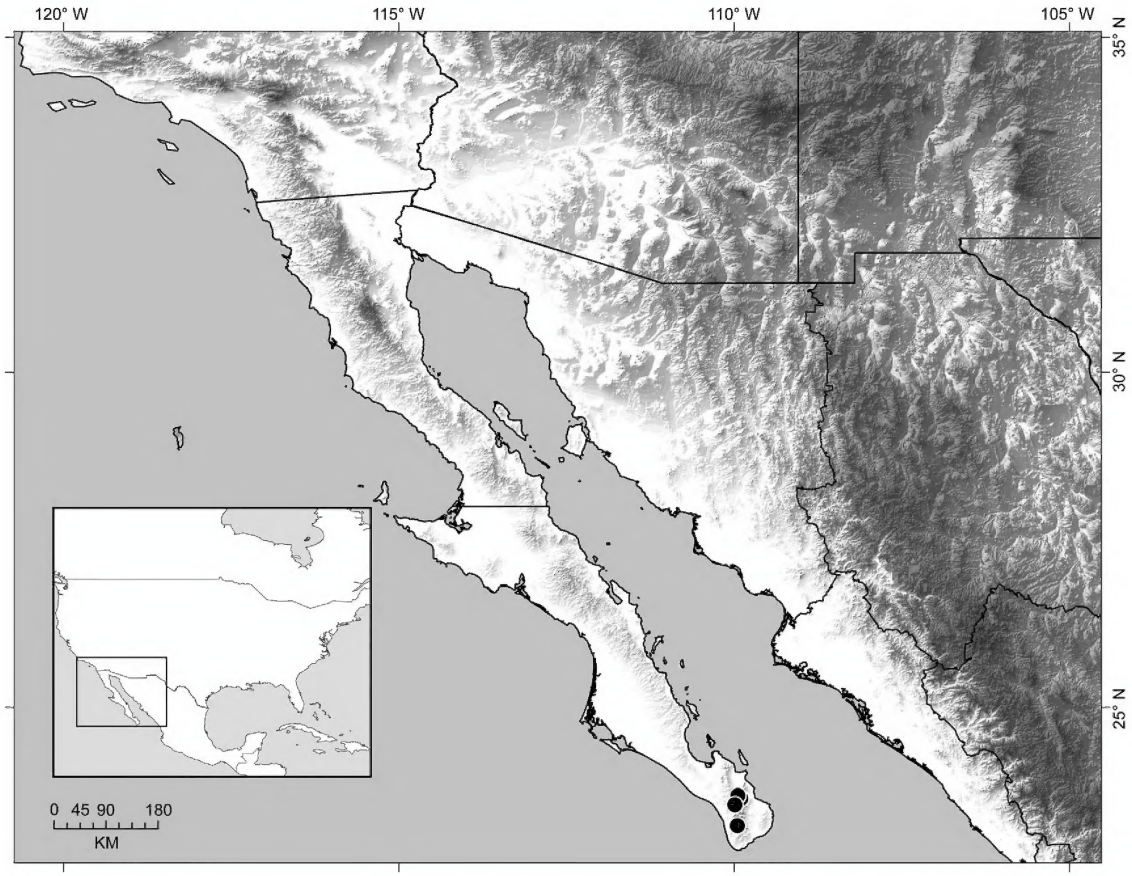

Fig. 4. Map of northwestern Mexico, plotting known locality records for *Konetontli pattersoni* (Williams and Haradon, 1980) (circles) based on data collected in the present study.

described vaejovids with a subaculear tubercle. *Vaejovis zihuatanejensis* was subsequently synonymized with *V. acapulco* by Francke and Ponce-Saavedra (2005), who described the eighth vaejovid with a subaculear tubercle, *Vaejovis kuarapu* Francke and Ponce-Saavedra, 2005, from Michoacán, Mexico. Francke and Ponce-Saavedra (2005: 66, 67) for the first time compared all vaejovid species with a subaculear tubercle and offered further evidence that *V. mumai* and *V. spicatus* are not closely related to the other species:

> The two northern species [*V. mumai* and *V. spicatus*] appear to be more closely related to each other in that they share a globose telson, the subaculear tooth is conical in shape, and they lack fuscous markings on body. The five Mexican species also appear to be more closely related to each other than to the northern species in that they share a non-globose telson, the subaculear tubercle tooth is spinoid and slightly compressed laterally, and their bodies are heavily infuscate.

Francke and Ponce-Saavedra (2005) mistakenly claimed that the distal barb margin of the hemispermatophore of *V. kuarapu* was smooth. As demonstrated below, the margin possesses fine spines or hooks.

When Soleglad and Fet (2008) subsequently presented their classification of Vaejovidae, the genus *Wernerius* was created to accommodate the two northern species, *V. mumai* and *V. spicatus* (a third, *W. inyoensis*, has since been added). Only the second of the two diagnostic characters proposed for the genus,

i.e., the presence of granular ventromedian (i.e., ventral submedian) carinae on metasomal segments I–IV and the position of trichobothria *ib* and *it* on the pedipalp fixed finger, was found to be synapomorphic in the analyses by González-Santillán and Prendini (2015), however.

Soleglad and Fet (2008: 89) also discussed the "other vaejovids with subaculear tubercle" and concluded, based on Francke and Ponce-Saavedra (2005), that *V. acapulco*, *V. chamelaensis*, *V. kuarapu*, *V. nayarit*, and *V. pattersoni* should be retained in the *mexicanus* group of *Vaejovis* (all that remained after new names were assigned to the other groups), without testing their phylogenetic position or possible relationship to *Hoffmannius* Soleglad and Fet, 2008, the new name for Williams' (1970a) *eusthenura* group:

> all [Mexican *Vaejovis* with a subaculear tubercle] should tentatively be placed in subfamily Vaejovinae ... As far as a definite *Vaejovis* group affiliation, if any, we will defer on this until actual specimens are available for examination, but for this study they are placed in the "mexicanus" group.

González-Santillán and Prendini (2013: 15, fig. 8) redefined subfamily Syntropinae and demonstrated that the spinose distal barb margin of the hemispermatophore unites the Mexican species with a subaculear tubercle with other members of the subfamily, rather than Vaejovinae. Additionally, the laminar hooks of these species are situated distally ("elevated") as in other Syntropinae and related vaejovid taxa, rather than basally, as in Vaejovinae, i.e., the *mexicanus* group of *Vaejovis* (Sissom, 1989; Graham and Bryson, 2010; Santibañez-López and Francke, 2010), another difference Soleglad and Fet (2008) overlooked.

The phylogenetic analyses of González-Santillán and Prendini (2015) placed *Wernerius* in a monophyletic group with *Serradigitus*, confirming Sissom's (1993) hypothesis that *V. mumai* and *V. spicatus* are related to *Serradigitus*. Only the second of three characters cited by Sissom (1993) as evidence that *V. mumai* and *V. spicatus* are phylogenetically related to *Serradigitus*, i.e., the modified proximal pectinal tooth (which is enlarged, oval, and lacking peg sensilla) of the female, unequivocally associated these taxa, however. The analyses falsified Soleglad and Fet's (2008) placement of the Mexican species with a subaculear tubercle in the *mexicanus* group of *Vaejovis* and hence in Vaejovinae, instead placing these species in a monophyletic group comprising other members of Syntropinae, united by a hemispermatophore with a spinose distal barb margin. The creation of a new genus, *Konetontli*, to accommodate these species was justified on the basis of their phylogenetic position and unique, diagnostic character combination (González-Santillán and Prendini, 2013). In addition to the laterally compressed subaculear tubercle with a blunt tip, sometimes associated with smaller tubercles situated anteriorly along the ventral median carina of the telson vesicle, *Konetontli* is supported by the position of trichobothrium *ib* situated at the seventh retrolateral denticle on the pedipalp chela fixed finger, and the matte median surfaces of tergites III–VI.

MATERIAL AND METHODS

Scorpion specimens were collected mostly by ultraviolet (UV) light detection at night using portable UV lamps, comprising mercury vapor tubes attached to a chromium reflector, and powered by a 12V, 7 amp/hr battery, or Maglite flashlights modified with UV LED attachments. Some specimens were collected by turning rocks and other objects on the ground, during the day.

Material examined is deposited in the following collections: American Museum of Natural History, New York (AMNH); Colección de Aracnología y Entomología del Centro de Investigaciones Biológicas del Noroeste, La Paz, Baja California Sur, Mexico (CAECIB); California Academy of Sciences, San Francisco, California (CAS); Colección Nacional de Arácnidos, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (CNAN); Facultad de Ciencias, Universidad Nacional Autónoma de México, Mexico City (FCUNAM); Ohio State University, Museum of Biological Diversity, Columbus, Ohio (OSAL). Specimens at the AMNH, CAS and CNAN bearing ARA (Arachnida) numbers were collected during a "Revisionary

Fig. 5. *Konetontli* González-Santillán and Prendini, 2013, carapaces, dorsal aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **C**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). Scale bars = 1 mm (**A**), 0.5 mm (**B**, **C**, **D**).

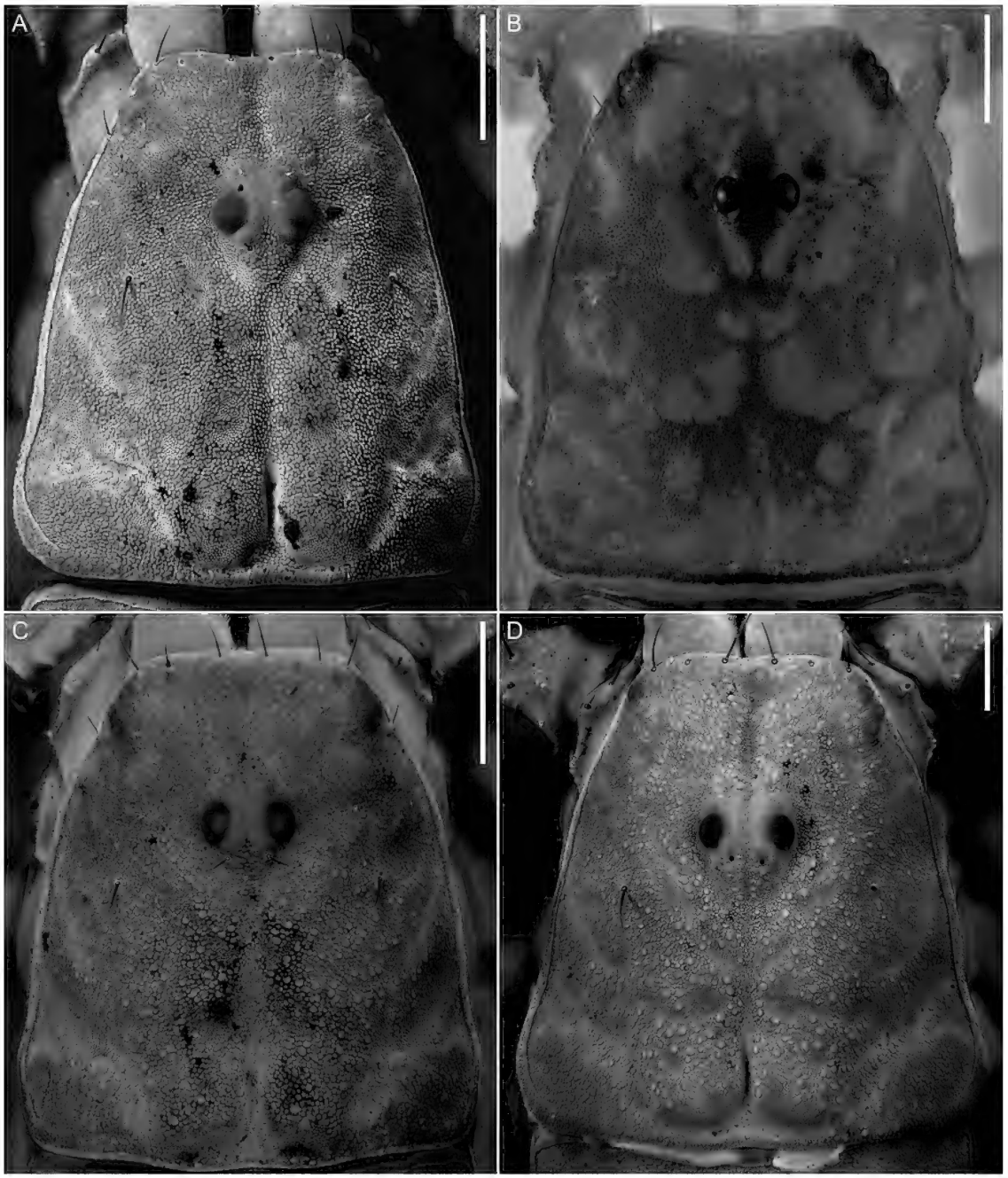

Fig. 6. *Konetontli* González-Santillán and Prendini, 2013, carapaces, dorsal aspect. **A**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). **B**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **C**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **D**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). Scale bars = 0.5 mm.

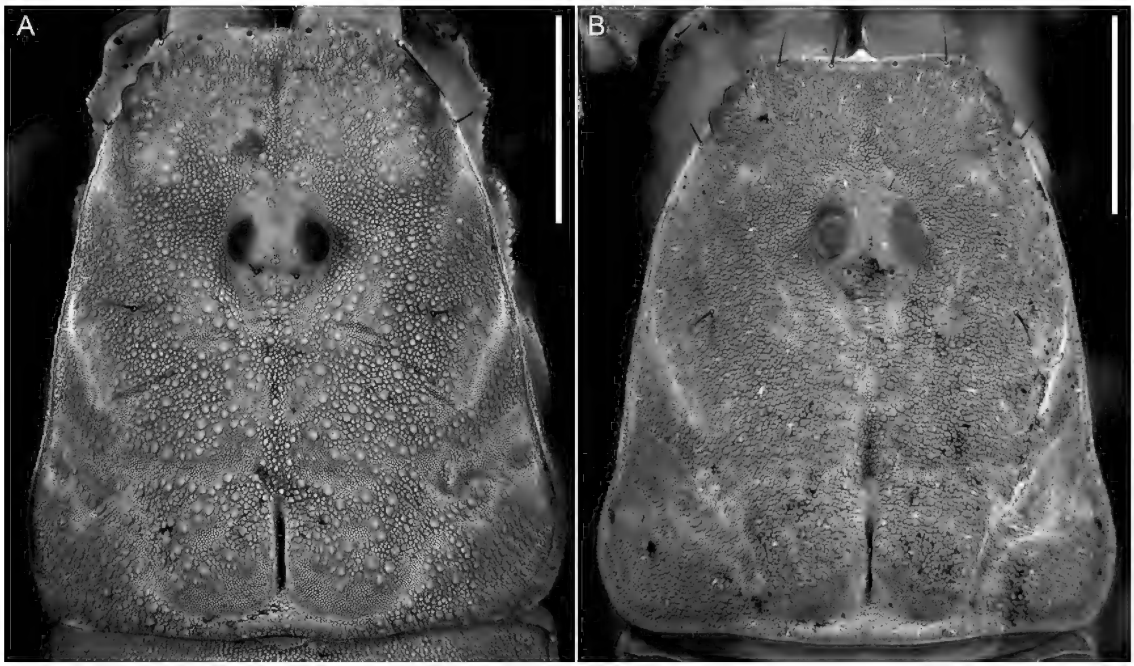

Fig. 7. *Konetontli* González-Santillán and Prendini, 2013, carapaces, dorsal aspect. **A**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **B**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). Scale bars = 1 mm.

Syntheses in Systematics" grant from the U.S. National Science Foundation. Additional material is deposited in the following collections: Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, Mexico City (ENCB); Instituto de Ecología y Sistemática, Havana, Cuba (IES); Universidad Autónoma de Guerrero, Zihuatanejo, Mexico (UAGRO), Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Mexico (UMSNH).

Morphological terminology follows González-Santillán and Prendini (2013). Hemispermatophores were cleared with clove oil for illustration. Measurements (mm), following Sissom et al. (1990), were taken with an ocular micrometer and illustrations produced using a Nikon SMZ 1000 or 1500 stereomicroscope fitted with a camera lucida. Digital images were taken under visible and UV light using a Microptics ML1000 digital imaging system. Images and illustrations were edited using Adobe Photoshop CS5.

Localities were georeferenced in the field with a portable GPS (Garmin® II Plus) or retroactively using GEOLocate (Rios and Bart, 2010) and Google Earth. Distribution maps were generated using ArcMap 9.3.1 (Environmental Systems Research Institute, Redlands, California), by superimposing point locality records on layers depicting the topography of North America, generated from digital elevation model files with 1 arc degree of resolution, obtained from the United States Geological Survey.

SYSTEMATICS

FAMILY VAEJOVIDAE THORELL, 1876
Subfamily Syntropinae Kraepelin, 1905

Konetontli González-Santillán and Prendini, 2013

Vaejovis pattersoni Williams and Haradon in Williams, 1980 [= *Konetontli pattersoni* (Williams and Haradon in Williams, 1980)], type species, by original designation.

Vaejovis eusthenura group (part): Williams, 1980: 65, figs. 56F, 69, 75, tables 1, 2; 1986: 358; Sissom, 2000: 530, 531; Francke and Ponce-Saavedra, 2005: 67.

Vaejovis mexicanus group (part): Sissom, 2000: 542; Soleglad and Fet, 2008: 1, 2, 5, 13, 26, 37, 40, 46, 71, 73, 89, 99, 100, figs. 126, 196, 207, tables 2, 9.

Konetontli González-Santillán and Prendini, 2013: 43, 54, 55, 65, 66, figs. 69, 75, tables 1, 5; 2015: 349, 352, 355, 359–361, 367, 391, 392, 398, table 5.

DIAGNOSIS: *Konetontli* differs from all other genera of Syntropinae by the presence of a spiniform subaculear tubercle, slightly compressed laterally with a rounded tip, and sometimes associated with smaller accessory tubercles situated anteriorly along the ventromedian carina of the telson vesicle. Additional diagnostic characters of the genus are as follows. Species of *Konetontli* are very small, with total length (adult), 14–25 mm. The tergites are entirely infuscate and most of the integument uniformly finely granular (matte). Pedipalp chela trichobothrium *it* is situated between RD6 and the macroseta situated at the position of RD7 (which is absent), and trichobothrium *ib* proximal to the macroseta at the position of RD7. Metasomal segments I, II, and, in some cases, III are wider than long.

Konetontli shares with *Kuarapu* Francke and Ponce-Saavedra, 2010, *Maaykuyak* González-Santillán and Prendini, 2013, *Syntropis* Kraepelin, 1900, *Vizcaino* González-Santillán and Prendini, 2013, *Chihuahuanus bilineatus* (Pocock, 1898), *C. coahuilae* (Williams, 1968), and *Thorellius cristimanus* (Pocock, 1898) the presence of a secondary hook on the hemispermatophore, created by an extension of the axial carina of the distal lamina, that forms a pronounced bifurcation with the primary hook (González-Santillán and Prendini, 2013: fig. 8A, B). *Konetontli* resembles *Mesomexovis* González-Santillán and Prendini, 2013, in the dense infuscation of the carapace and tergites I–VII, and the partially to completely infuscate mesosomal sternite VII, but adults of *Mesomexovis* are more than 30 mm in total length. *Konetontli* shares with *Maaykuyak waueri* (Gertsch and Soleglad, 1972), and *Paravaejovis pumilis* Williams, 1980, a single pair of ventrodistal spinules on the telotarsi. However, both *M. waueri* and *P. pumilis* are separated from *Konetontli* by the absence of a subaculear tubercle, and *P. pumilis* further by the neobothriotaxic pedipalp chela and uniformly pale, immaculate coloration.

INCLUDED SPECIES: *Konetontli acapulco* (Armas and Martín-Frías, 2001); *Konetontli chamelaensis* (Williams, 1986); *Konetontli ignes*, sp. nov.; *Konetontli ilitchi*, sp. nov.; *Konetontli juxtlahuaca*, sp. nov.; *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005); *Konetontli migrus*, sp. nov.; *Konetontli nayarit* (Armas and Martín-Frías, 2001); *Konetontli pattersoni* (Williams and Haradon, 1980); *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov.

DISTRIBUTION: *Konetontli* is restricted to Mexico and recorded from six states (table 1; figs. 1–3): Baja California Sur, Colima, Guerrero, Jalisco, Michoacán, and Nayarit. The genus has a disjunct distribution. *Konetontli pattersoni* inhabits the Cape region of the Baja California Peninsula, isolated from the other species on the Mexican mainland by the Gulf of California. Five of the mainland species occur in the lowlands of the Pacific coast from Nayarit to Guerrero, two in the valleys in the Sierra Madre del Sur connected with the Pacific coast, and two in the Balsas Depression. All species inhabit tropical deciduous forest at altitudes ranging from sea level to less than 1000 m. More species probably await discovery along the Pacific coast and in the adjacent valleys.

ECOLOGY: Specimens for which habitat data are available were mostly collected under stones and other debris, often in areas with a dense layer of leaf litter (Armas and Martín-Frías, 2001; Baldazo-Monsivaiz, 2003; González-Santillán, 2004), suggesting a requirement for high relative humidity (González-Santillán and Prendini, 2013). The very small size and cryptic coloration of these scorpions, taken together with available habitat data, are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001). The occurrence of

a few specimens inside caves was probably incidental, because these species do not possess troglomorphies and have also been collected on the surface.

KEY TO IDENTIFICATION OF THE SPECIES OF *KONETONTLI*

1. Metasomal segments I–IV ventral submedian carinae and segment V ventral median carina weakly granular or obsolete (figs. 11A, C, E, 13A, E); leg III telotarsus ventromedian row with 14 spinules 2
– Metasomal segments I–IV ventral submedian carinae and segment V ventral median carina distinct, complete, granular (figs. 11B, D, 13B, C, D); leg III telotarsus ventromedian row with 11 spinules 6
2. Metasomal segment V ventral lateral carinae obsolete (fig. 11A) 3
– Metasomal segment V ventral lateral carinae distinct, granular (fig. 13A, E) 5
3. Pedipalp chela incrassate (fig. 19F–I); chela manus prolateral dorsal carina distinct, granular along entire length, dorsal prolateral carina distinct, granular distally on manus; movable finger median denticle row comprising seven denticle subrows with seven retrolateral denticles . . . . . *K. acapulco*
– Pedipalp chela slender (figs. 23F–I, 26F–I); chela manus prolateral dorsal and dorsal prolateral carinae obsolete, smooth; movable finger median denticle row comprising five or six denticle subrows with five or six retrolateral denticles 4
4. Pedipalp femur dorsal prolateral carina granular and markedly infuscate; patella carinae, dorsal and retrolateral surfaces markedly infuscate; chela manus almost immaculate except distally, fingers infuscate (fig. 26); fixed and movable fingers median denticle rows each comprising six denticle subrows with six retrolateral denticles. . . . . *K. juxtlahuaca*, sp. nov.
– Pedipalp femur dorsal prolateral carina smooth and infuscate distally; patella carinae, dorsal and retrolateral surfaces almost immaculate; chela manus and fingers entirely infuscate, carinae markedly so (fig. 23); fixed and movable fingers, median denticle rows each comprising five denticle subrows with five retrolateral denticles... *K. ignes*, sp. nov.
5. Carapace anterior margin with shallow median notch (fig. 6B); chela movable finger median denticle row comprising six median denticle subrows with six retrolateral denticles . . . . . *K. kuarapu*
– Carapace anterior margin without median notch (fig. 7B); chela movable finger median denticle row comprising seven median denticle subrows with seven retrolateral denticles . . . . . *K. zihuatanejensis*, comb. nov.
6. Pedipalp chela slender (figs. 21F–I, 24F–I); fixed finger median denticle row comprising five median denticle subrows with five retrolateral denticles 7
– Pedipalp chela incrassate (figs. 30F–I, 32F–I, 34F–I); fixed finger median denticle row comprising six median denticle subrows with six retrolateral denticles 8
7. Metasomal segment I ventral submedian carinae obsolete (fig. 11B); ventral lateral and ventral submedian carinae of metasomal segments I–V infuscate only at base of macrosetae; femur dorsal retrolateral carina partially infuscate; pedipalp chela manus immaculate (fig. 21F–I); movable finger median denticle row comprising five median denticle subrows with five retrolateral denticles . . . . . *K. chamelaensis*
– Metasomal segment I ventral submedian carinae distinct, granular (fig. 11D); ventral lateral and ventral submedian carinae of metasomal segments I–V completely infuscate; femur dorsal retrolateral carina completely infuscate; pedipalp chela manus intercarinal surfaces diffusely infuscate, carinae markedly infuscate (fig. 24F–I); movable finger median denticle row comprising six median denticle subrows with six retrolateral denticles . . . . . *K. ilitchi*, sp. nov.
8. Pectinal tooth count, 10–11 (♂); sternite VII ventral surface with hyaline glandular area posteromedially, protruding slightly from adjacent surfaces; metasomal segments II–IV ventral submedian carinae finely granular; pedipalp chela manus carinae immaculate (fig. 30F–I) . . . . . *K. migrus*, sp. nov.
– Pectinal tooth count, 12–14 (♂); sternite VII ventral surface without hyaline glandular area posteromedially; metasomal segments II–IV ventral submedian carinae coarsely granular; pedipalp chela manus carinae infuscate distally (figs. 32F–I, 34F–I) 9
9. Telson globose; subaculear tubercle compound, primary tubercle elongate, with two or more secondary tubercles proximally on ventral median carina (fig. 13C); pedipalp chela fixed finger sublinear without proximal notch or median lobe, fingers fitting together evenly, such that little or no proximal gap evident, when closed (fig. 32G, I) . . *K. nayarit*
– Telson slender and elongated; subaculear tubercle simple, primary tubercle short, rarely with minute secondary tubercle proximally

on ventral median carina (fig. 13D); pedipalp chela fixed finger emarginate with proximal notch and shallow median lobe, fingers fitting together unevenly, such that distinct proximal gap evident, when closed (fig. 34 G, I). . . . . *K. pattersoni*

Konetontli acapulco (Armas and Martín-Frías, 2001)
Figures 1, 2, 4, 5A, 8A, 10A, 11A, 14A, 15A, 16A, B, 18, 19; tables 1–3

Vaejovis acapulco Armas and Martín-Frías, 2001: 9–13, fig. 1A–F, tables 1–3; Armas, 2003: 240; González-Santillán, 2004: 29; Francke and Ponce-Saavedra, 2005: 63, 64, 66, 67, figs. 11, 18, 19 (part); Soleglad and Fet, 2008: 89, 99; Baldazo-Monsivaiz et al., 2012: 146, table 1; 2013: 102, table 1.

Konetontli acapulco (Armas and Martín-Frías, 2001): González-Santillán and Prendini, 2013: 28, 35, 36, figs. 16D, 26B, 28B.

TYPE MATERIAL: **MEXICO: Guerrero:** *Municipio de Acapulco de Juárez*: Holotype ♂ (CNAN T0174), Acapulco, Colonia Francisco Villa, 25.v.1999, E. Martín and A. Losoya (Project AgreEvo-Ficam). Paratypes: 1 ♀, 1 subad. ♂, 1 subad. ♀ (CNAN T0176), same data as holotype; 1 ♂, 1 juv. ♀ (IES), Acapulco, Colonia Alta Progreso 16.ix.1999, E. Martín and J. Estévez (Project AgreEvo-Ficam); 2 ♀, 2 juv. (CNAN T0175), Acapulco, Colonia del PRI, 16.ix.1999, E. Martín and J. Estévez (Project AgreEvoFicam), 1 ♂, 2 ♀ (IES), same data except "21.ix.1999"; 2 ♀ (ENCB), Acapulco, Fraccionamiento Mozimba, 31.iii.1996, E. Martín and A. Laguerenne, 3 ♀, 1 juv. ♀ (IES), same data except "18.vii.1998"; 1 ♀, 1 juv. (ENCB), Acapulco, Colonia Jardín Mangos, 20.x.1999, E. Martín and J. Estévez (Project AgreEvoFicam). *Municipio de Zihuatanejo de Azueta*:1 ♂, 1 ♀, 1 juv. ♀ (ENCB), Ixtapa Zihuatanejo, 11.viii.1999, E. Martín, under stone.

DIAGNOSIS: *Konetontli acapulco* is closely related to *K. ignes*, sp. nov., *K. juxtlahuaca*, sp. nov., *K. kuarapu*, and *K. zihuatanejensis*, comb. nov., with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of obsolete ventral submedian carinae on metasomal segments I–IV and 14 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli acapulco* is the sister species of *K. zihuatanejensis*, comb. nov., with which it shares obsolete ventral submedian carinae on metasomal segments I–III and seven denticle subrows with seven retrolateral denticles in the median denticle row of the pedipalp chela movable finger. The two species differ in the following respects. The ventral submedian carinae of metasomal segment IV are obsolete, and the ventral lateral carinae of segment V vestigial, expressed as a short row of granules in the posterior quarter, in *K. acapulco*, whereas the ventral submedian carinae of segment IV are partial, expressed as a short row of granules in the posterior quarter, and the ventral lateral carinae of segment V complete and finely serrated, in *K. zihuatanejensis*, comb. nov. The telson ventral surface is smooth, with a simple subaculear tubercle in *K. acapulco* whereas the surface is sparsely granular, with a compound subaculear tubercle, comprising primary and secondary tubercles, in *K. zihuatanejensis*, comb. nov. The prolateral dorsal, dorsal prosubmedian, dorsal prolateral, prolateral median, and prolateral submedian carinae of the pedipalp chela are granular in *K. acapulco*, but obsolete and smooth in *K. zihuatanejensis*, comb. nov.

Konetontli acapulco differs from the other three species as follows. The median denticle row of the pedipalp chela movable finger possesses seven median denticle subrows with seven retrolateral denticles in *K. acapulco*, but six in *K. kuarapu* and *K. juxtlahuaca*, sp. nov., and five in *K. ignes*, sp. nov. The pedipalp chela is immaculate in *K. acapulco* whereas the chela carinae and intercarinal surfaces are markedly infuscate in *K. ignes*, sp. nov., and the chela fingers infuscate in *K. juxtlahuaca*, sp. nov.

DESCRIPTION: The following redescription, which is based on the type material at CNAN and additional material examined, supplements the original description by Armas and Martín-Frías (2001).

Color and infuscation: Cheliceral manus dorsal surface immaculate, base of fixed and movable fingers infuscate. Carapace base color yellowish, entirely infuscate. Pedipalps base color yellow-orange, carinae and chela fingers diffusely infuscate. Legs base color yellow. Coxosternal region,

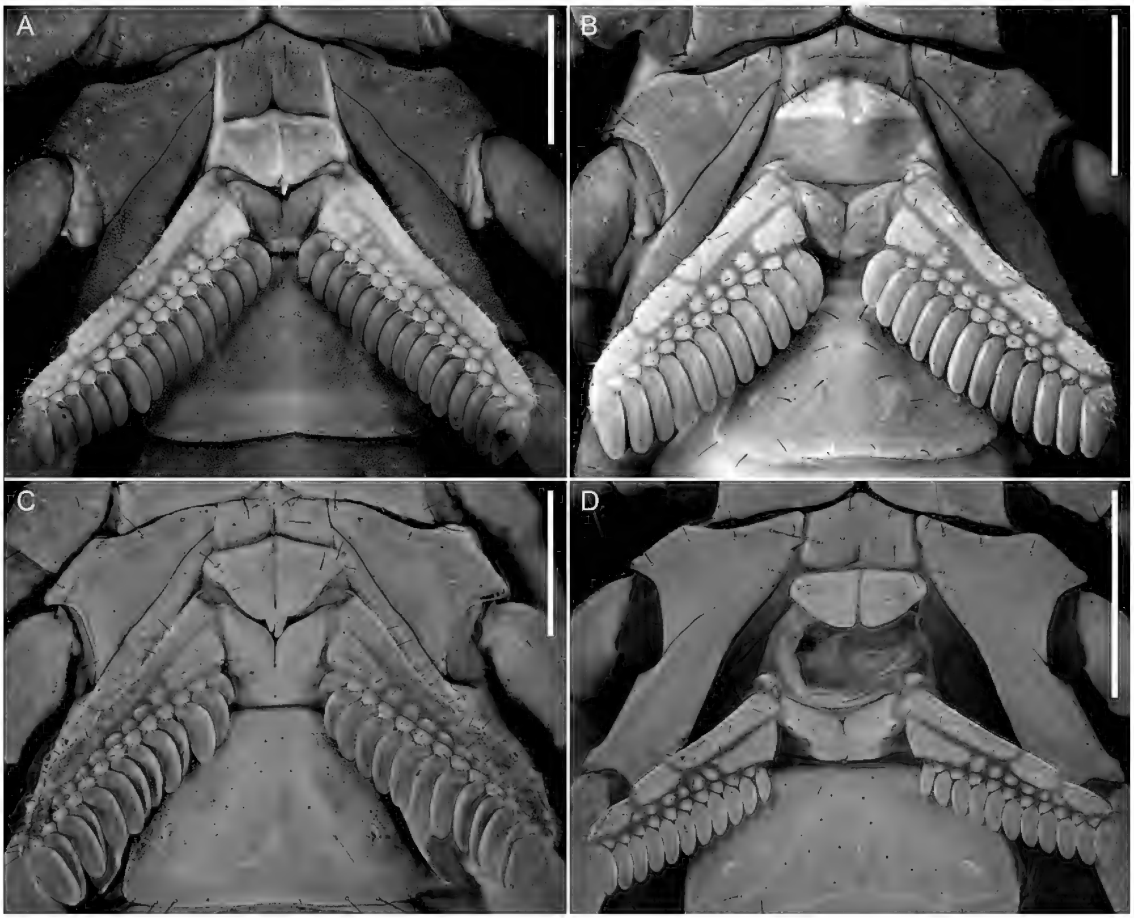

Fig. 8. *Konetontli* González-Santillán and Prendini, 2013, sternum, genital operculum and pectines, ventral aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). **C**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). Scale bars = 1 mm.

genital operculum, and pectines immaculate. Mesosoma base color yellowish brown, entirely infuscate; tergites I–VII dorsal median carinae immaculate, dorsal lateral carinae infuscate; sternites III–VII ventral surfaces immaculate. Metasoma base color brownish yellow; all carinae irregularly infuscate; surfaces between dorsal submedian and ventral median carinae faintly infuscate. Telson vesicle base color yellowish orange, paler than metasomal segment V; aculeus reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Movable finger ventral surface with serrula, comprising 27/27 tines, in distal half.

Carapace: Length 1.2 times greater than posterior width (table 2). Anterior margin sublinear, with shallow median notch and three pairs of macrosetae (fig. 4A). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace, superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus shallow; posteromedian sulcus deep, narrow; posterolateral and posterior transverse sulci obsolete.

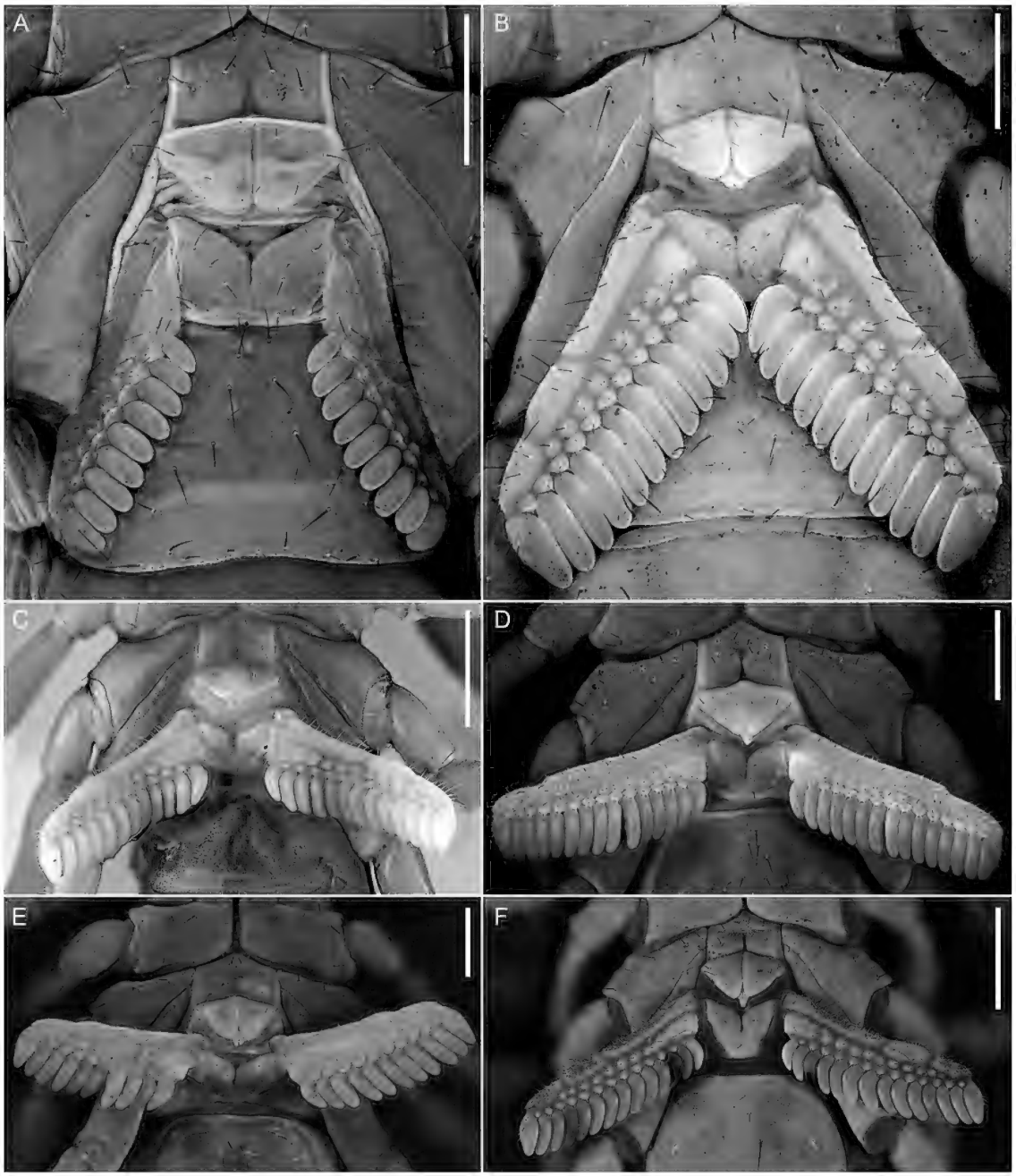

Fig. 9. *Konetontli* González-Santillán and Prendini, 2013, sternum, genital operculum and pectines, ventral aspect. **A**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **B**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **C**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **D**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). **E**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **F**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). Scale bars = 0.5 mm.

Fig. 10. *Konetontli* González-Santillán and Prendini, 2013, metasomal segments I–V, lateral aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **C**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). **E**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). Scale bars = 1 mm.

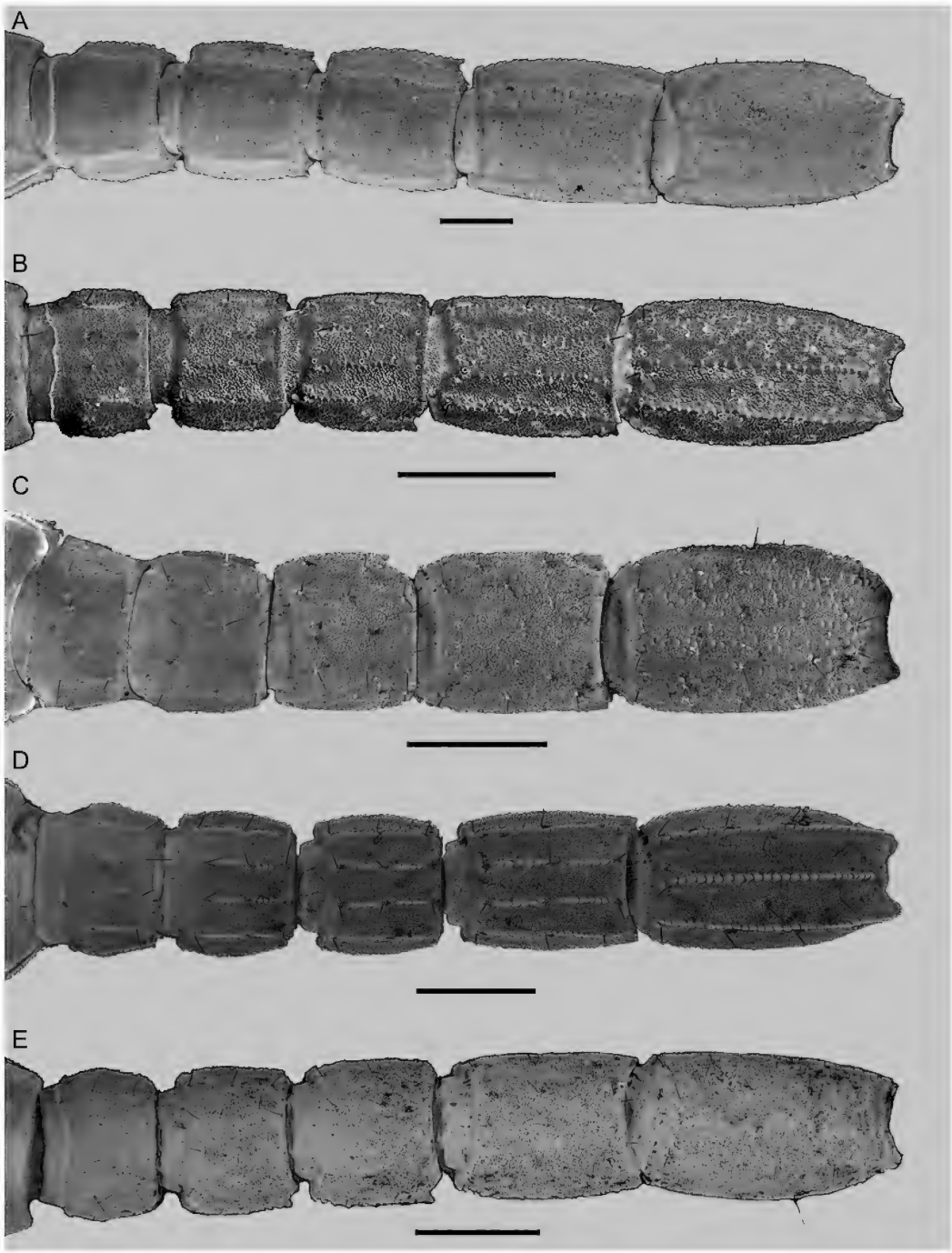

Fig. 11. *Konetontli* González-Santillán and Prendini, 2013, metasomal segments I–V, ventral aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **C**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). **E**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). Scale bars = 1 mm.

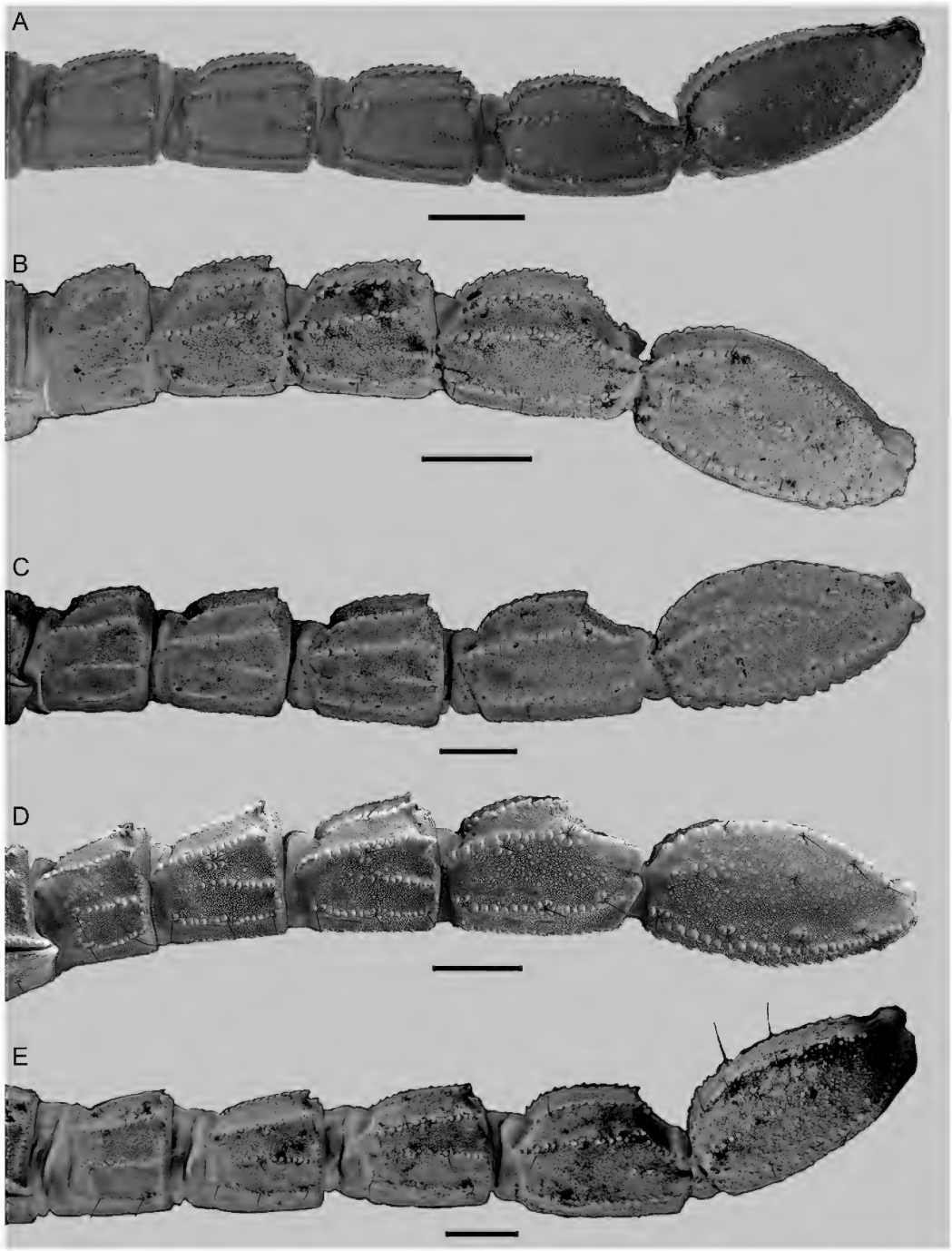

Fig. 12. *Konetontli* González-Santillán and Prendini, 2013, metasomal segments I–V, lateral aspect. **A**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **B**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **C**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **D**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **E**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). Scale bars = 1 mm.

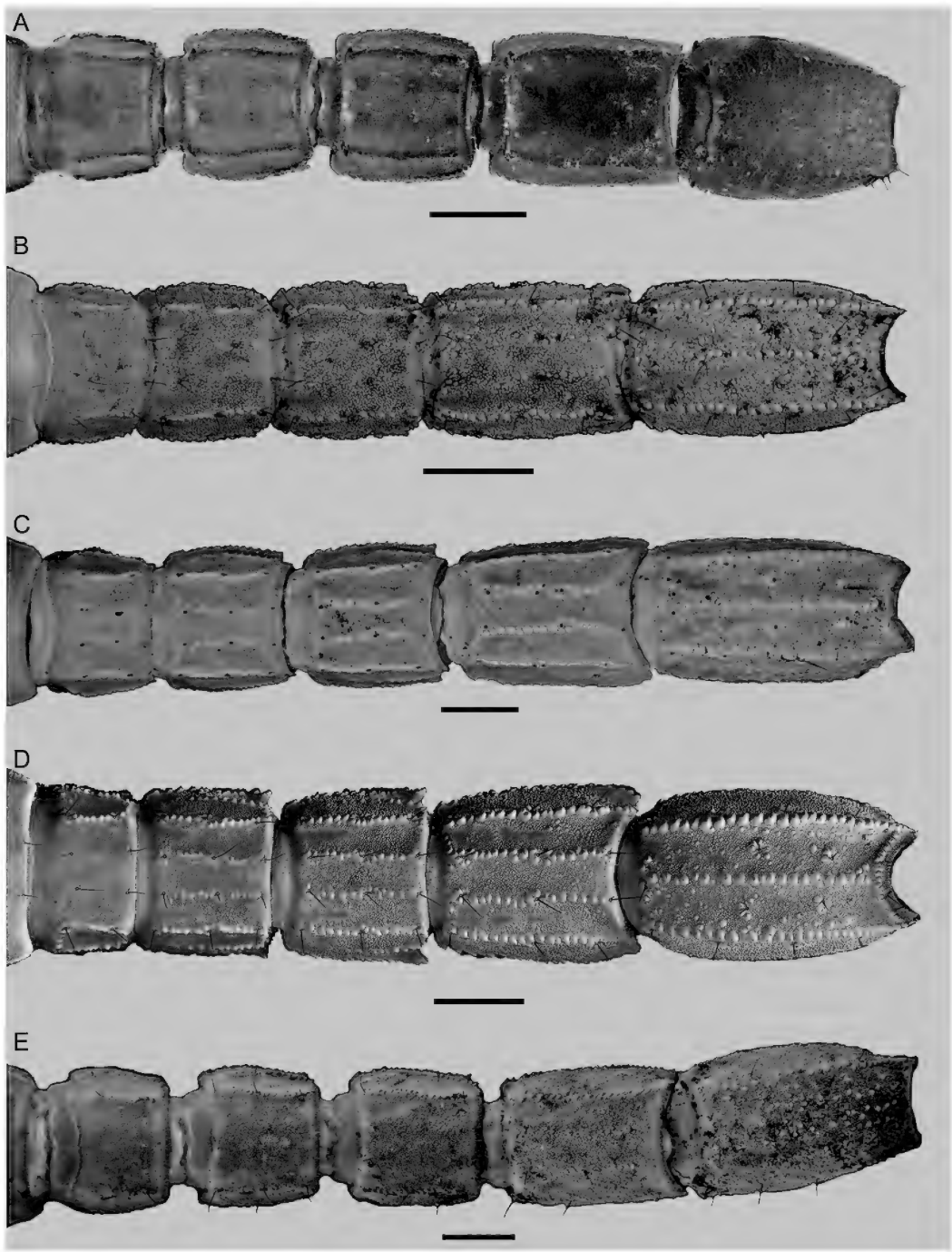

Fig. 13. *Konetontli* González-Santillán and Prendini, 2013, metasomal segments I–V, ventral aspect. **A**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **B**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **C**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **D**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **E**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). Scale bars = 1 mm.

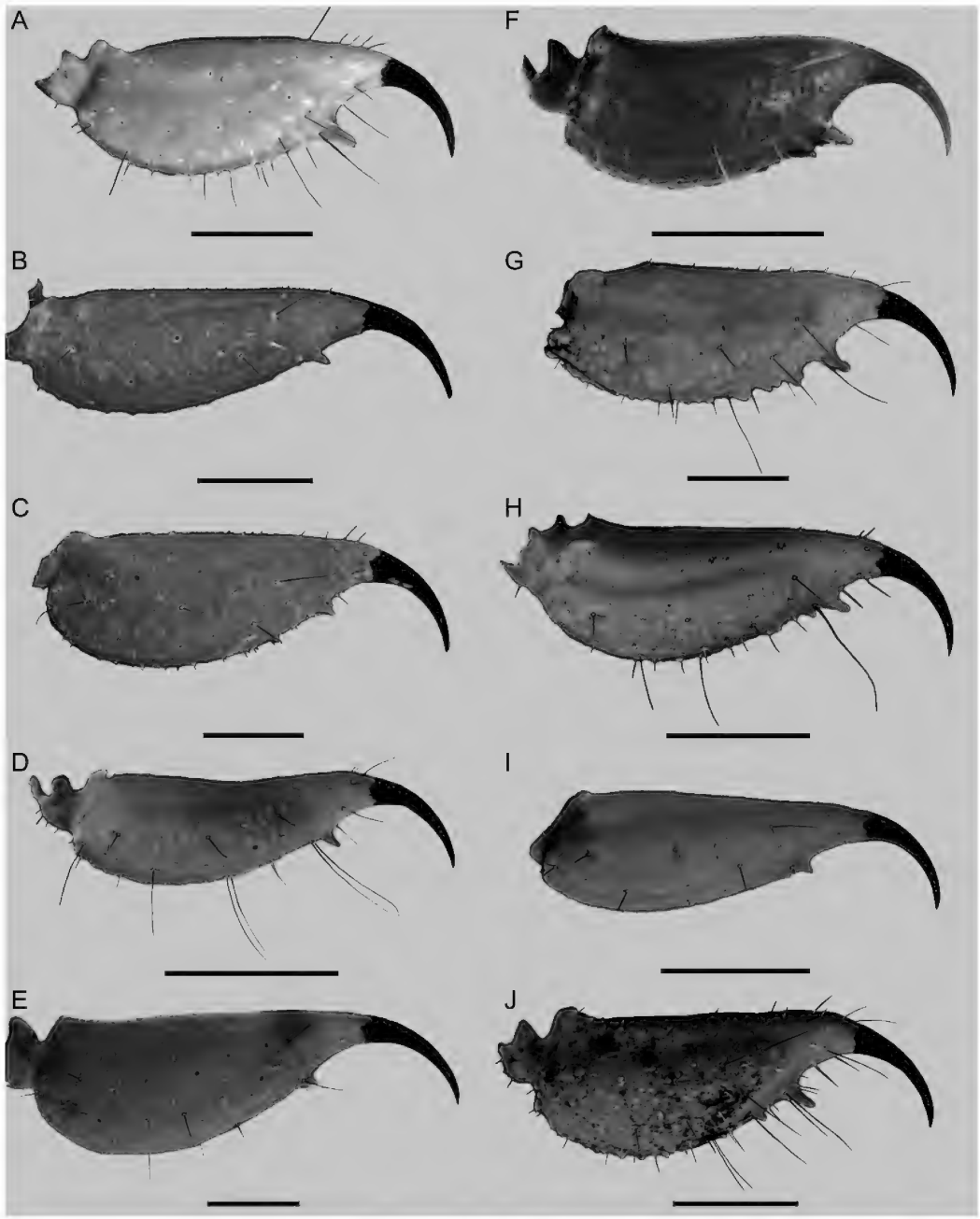

Fig. 14. *Konetontli* González-Santillán and Prendini, 2013, telson, lateral aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **C**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). **E**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). **F**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **G**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **H**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **I**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **J**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). Scale bars = 1 mm.

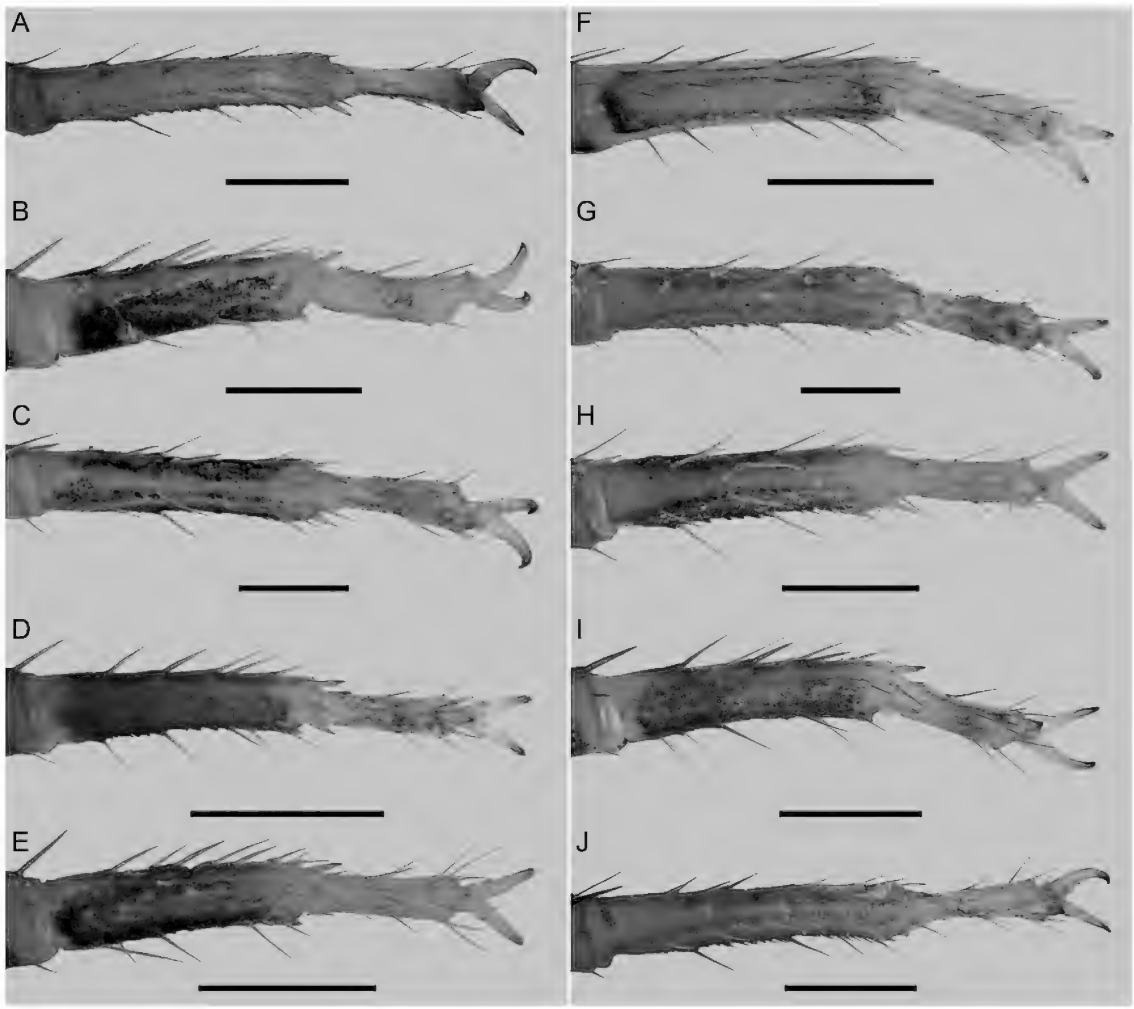

Fig. 15. *Konetontli* González-Santillán and Prendini, 2013, leg III, dextral basitarsus and telotarsus, ventral aspect. **A**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **B**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **C**. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885). **D**. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887). **E**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). **F**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **G**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). **H**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **I**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **J**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). Scale bars = 0.5 mm.

Surfaces matte, uniformly finely granular; posteromedian sulcus bordered by slightly larger granules; posterolateral sulcus smooth.

Coxosternal region: Sternum subequilateral pentagonal; 1.5 times wider than long (table 2); median sulcus deep; ventral surfaces matte; with four pairs of macrosetae (fig. 8A). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa II, proximal margin uniformly finely granular; subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with deep depression, medial margin smooth. Coxa IV length 2.1 times greater than coxa II length (table 2).

Pedipalps: Femur intercarinal surfaces matte (fig. 19A); dorsal prolateral, ventral

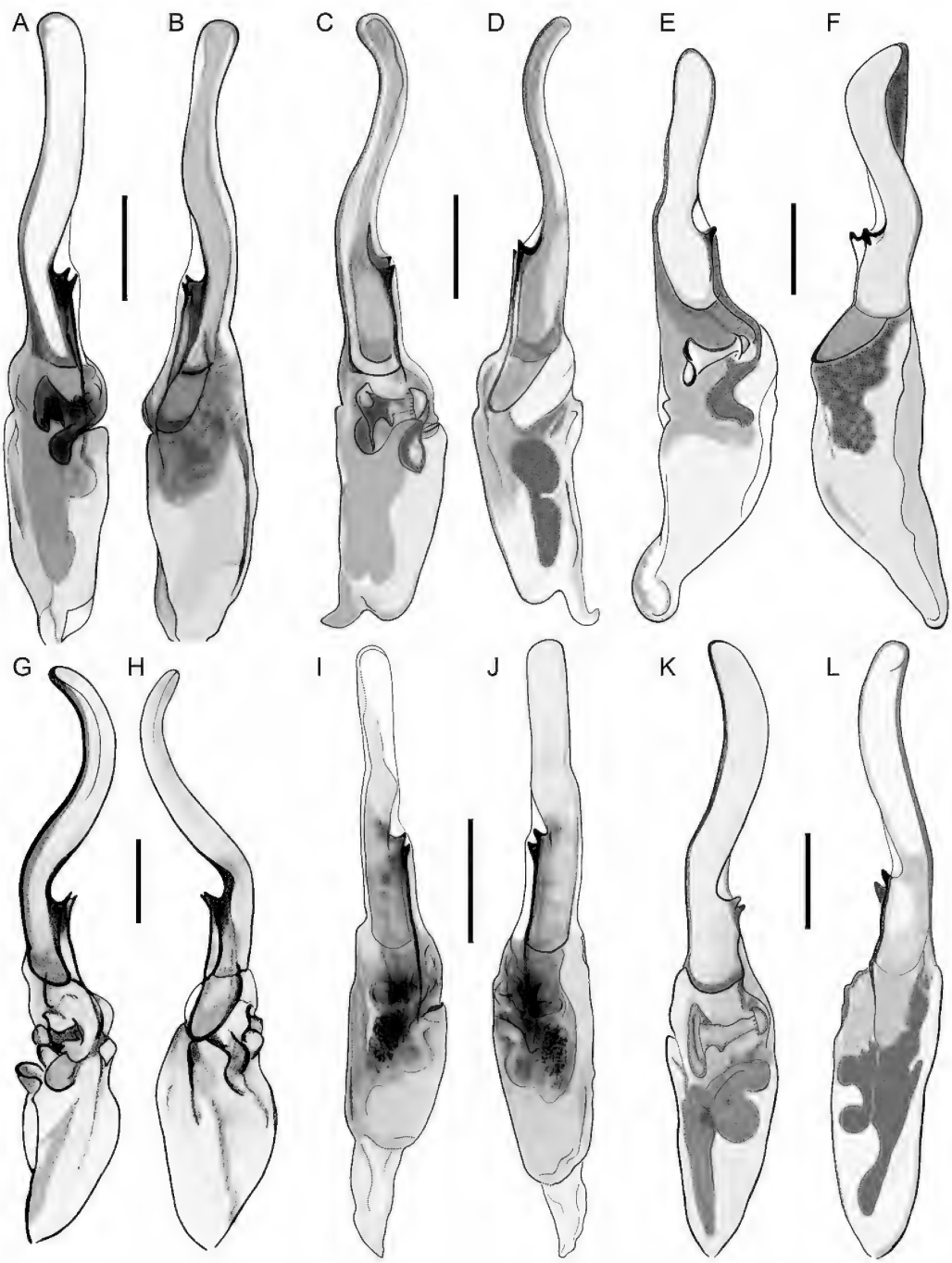

Fig. 16. *Konetontli* González-Santillán and Prendini, 2013, dextral hemispermatophore, ventral (**A**, **C**, **E**, **G**, **I**, **K**) and dorsal (**B**, **D**, **F**, **H**, **J**, **L**) aspects. **A**, **B**. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174). **C**, **D**. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS). **E**, **F**. *Konetontli ignes*, n. sp., ♂ (AMNH [LP 8584]). **G**, **H**. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). **I**, **J**. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH). **K**, **L**. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891). Scale bars = 1 mm (**A**, **B**, **I**, **J**), 0.5 mm (**C–F**, **G**, **H**, **K**, **L**).

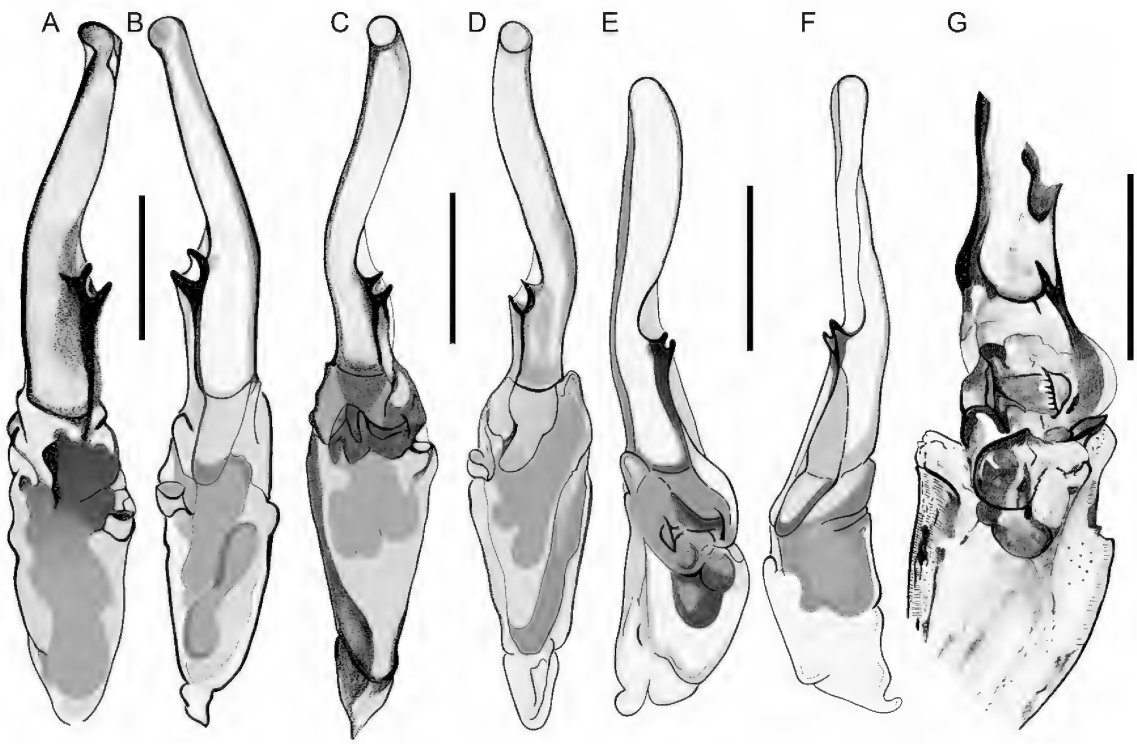

Fig. 17. *Konetontli* González-Santillán and Prendini, 2013, dextral hemispermatophore, ventral aspect (**A**, **C**, **E**, **G**), dorsal aspect (**B**, **D**, **F**), and detail of capsule (**G**). **A**, **B**. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177). **C**, **D**. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH). **E**, **F**. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893). **G**.*Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889). Scale bars = 0.5 mm (**A**, **B**, **G**), 1 mm (**C–F**).

prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina partial, restricted to median part of segment, comprising five or six enlarged spiniform granules, two or three smaller granules, and three or four macrosetae; retrolateral ventral, ventral median, and ventral retrosubmedian carinae vestigial, reduced to few granules proximally; prolateral ventral carina partial, reduced to three spiniform granules, each with one macroseta, and three smaller granules, extending two-thirds the length of segment; prolateral ventrosubmedian carina partial, reduced to four enlarged spiniform granules, two proximal granules adjacent to trichobothrium *i*, two distal granules each with one macroseta. Patella width equal to femur width (table 2); intercarinal surfaces matte (fig. 19B–E); dorsal prolateral, dorsal retrolateral, ventral prolateral, and ventral retrosubmedian carinae costate-granular; dorsal retrolateral and ventral retrolateral carinae respectively becoming obsolete proximally and distally; ventral median carina granular, becoming obsolete distally; prolateral ventral carina obsolete, delimited by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.6 times greater than patella length, 1.8 times greater than femur length (table 2); width 1.2 times greater than patella width, 1.4 times greater than femur width. Manus incrassate (fig. 19F–I); retrolateral intercarinal surfaces smooth proximally, finely and sparsely granular distally; other intercarinal surfaces smooth; prolateral dorsal, dorsal prosubmedian, dorsal prolateral,

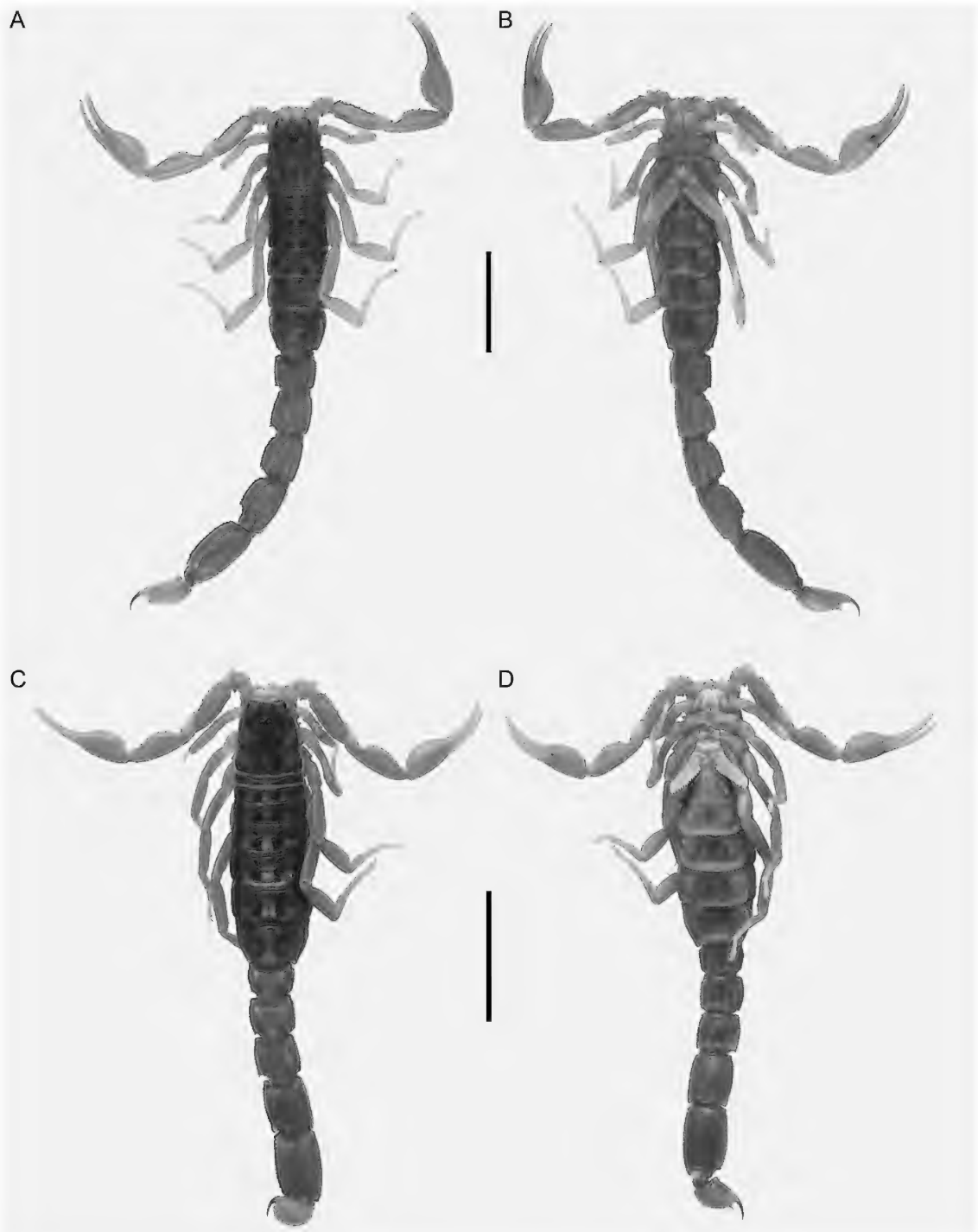

Fig. 18. *Konetontli acapulco* (Armas and Martín-Frías, 2001), habitus. **A**, **B**. Holotype ♂ (CNAN T0174). **C**, **D**. ♀ (CNAN SC3878). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 5 mm.

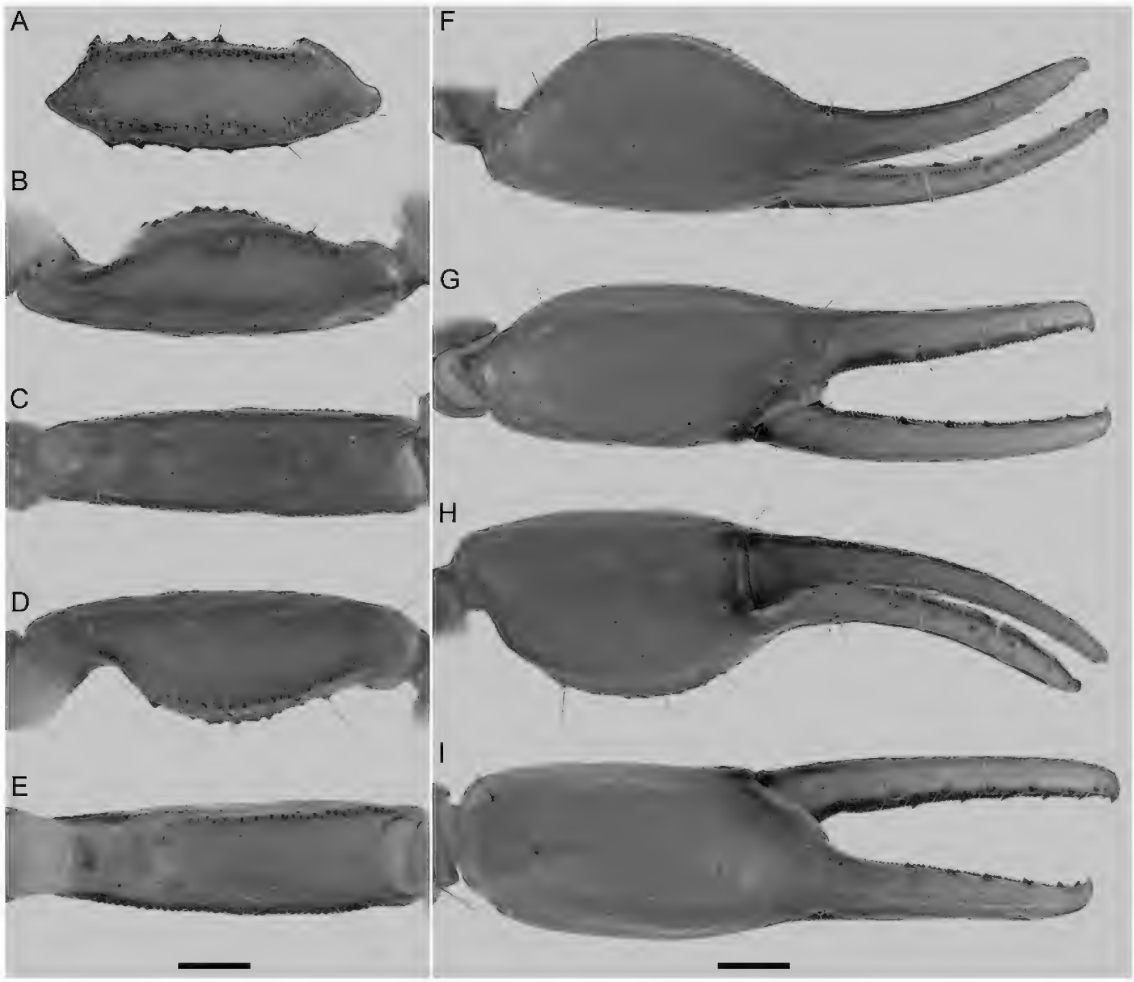

Fig. 19. *Konetontli acapulco* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0174), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

prolateral median, and prolateral submedian carinae granular, becoming more coarsely so in distal half of segment; other carinae obsolete. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising six denticle subrows flanked by six prolateral and retrolateral denticles, retrolateral denticles separated from subrows; movable finger median denticle row comprising seven denticle subrows, flanked by seven prolateral and retrolateral denticles, retrolateral denticles separated from medial rows, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi prolateral ventral and retrolateral ventral spinule rows complete on legs I–III (fig. 15A), absent on IV; retrolateral median and retrolateral dorsal rows absent on I–IV; macrosetal counts on I–IV, respectively: dorsal and retrolateral dorsal, 3:3:3:3; retrolateral ventral, 3:4:4:5; prolateral ventral, 4:4:4:4, proximal three macrosetae spiniform on IV; dorsal and retrolateral dorsal macrosetae arranged in two separate

parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and two pairs of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 8A), with two (♂) or three (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 2.05 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16A). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 16B). Hemimating plug developed from inner lobe, distal barb margin with approximately 13 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb length half basal plate length (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 8A). Marginal lamella comprising three sclerites. Medial lamella proximal two or three sclerites fused, nine separate. Fulcra, 14/14. Pectinal teeth, 13–16 (♂), 12–14 (♀). Pectines relatively short, midpoint (♂) or distal margin (♀) of third (distal) sclerite of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte (fig. 18A, C), dorsal median carinae complete, costate, dorsal lateral carinae vestigial, comprising few granules posteriorly; VII, intercarinal surfaces shagreened, dorsal median carina partial, restricted to anterior half of segment, costate, dorsal sublateral carinae vestigial, comprising few serrate granules restricted to anterior half of segment, dorsal lateral and lateral median carinae converging posteromedially, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth (fig. 18B, D), spiracles minute, slitlike, three times longer than wide; V posteromedian ventral surface with hyaline glandular area reduced (♂) or absent (♀); VII intercarinal surfaces smooth, without hyaline glandular area posteromedially, carinae obsolete except ventral submedian carinae moderately developed, costate-granular, lateral ventral carinae obsolete, each with one pair of macrosetae, ventral lateral and ventral submedian carinae each with two pairs of macrosetae.

Metasoma: Metasoma length 1.5 times greater than mesosoma length (table 2). Segment I width 1.3 times greater than length; II and III width slightly greater than or equal to length; V width 1.4 times greater than telson width. Segments I–V intercarinal surfaces matte, IV and V lateral and ventral intercarinal surfaces more coarsely granular (figs. 10A, 11A); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, vestigial, reduced to anterior granules on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior half, granular on II, partial, restricted to posterior two-thirds, granular on III, absent on IV and V; ventral lateral carinae complete, granular on I–III, partial, restricted to posterior two-thirds, granular on IV, vestigial, reduced to distal third or quarter, granular on V; ventral submedian carinae obsolete, reduced to macrosetae on I–V; ventral median carina obsolete on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 1:1:1:2:8; lateral median carinae, 1:2:2:3:5; lateral inframedian carinae, 2:2:2:2:0; ventral lateral carinae, 3:3:3:3:6; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 3:3:3:3:4.

Telson: Vesicle globose; length twice width, 1.9 times greater than aculeus length (table 2). Dorsal surface smooth. Ventral surface carinae obsolete, smooth, each with five or six pairs of macrosetae; ventromedian carina with six pairs of macrosetae; subaculear tubercle simple, conical, blunt (fig. 14A). Aculeus laterobasal microserration comprising 3–3 spinules.

DISTRIBUTION: *Konetontli acapulco* is restricted to coastal Guerrero, Mexico. It is known from seven localities, distributed from Ixtapa-Zihuatanejo to Acapulco, at altitudes ranging from 72 to 912 m (fig. 2).

ECOLOGY: According to Armas and Martín-Frías (2001), the paratypes of *K. acapulco*, from Mozimba, an urban location in Acapulco,

were collected in shaded vacant lots with abundant leaf litter and overgrown grass, where the species was sympatric with *Mesomexovis occidentalis* (Hoffmann, 1931). At Zihuatanejo, *K. acapulco* was collected close to an urban location, under rocks and litter in tropical deciduous forest ca. 100 m from the beach. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

REMARKS: Armas and Martín-Frías (2001) described this species in the genus *Vaejovis*. Sissom (2000) assigned it to the *mexicanus* group of *Vaejovis*, where it remained until it was transferred to *Konetontli* by González-Santillán and Prendini (2013).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Guerrero:** *Municipio de Acapulco de Juárez*: Cumbres de Llano Largo, 16° 49.505′N 99°49.999′W, 371 m, 29.i.2015, J.G. Baldazo-Monsivaiz, 1 ♀ (FCUNAM). *Municipio de José Azueta*: Colonia Agua de Correa, 17°38.698′N 101°31.093′W, 72 m, 1.viii.2008, O.F. Francke, H. Montaño, J. Ponce, and A. Quijano, tropical dry forest, 1 ♂, 1 ♀ (CNAN SC3878), 1 ♀ (AMNH [LP 9520]).

Konetontli chamelaensis (Williams, 1986)
Figures 2, 5B, 9E, 10B, 11B, 14B, 15B, 16C, D, 20, 21; tables 1–3

Vaejovis chamelaensis Williams, 1986: 355–358, fig. 1; Kovařík, 1998: 146; Beutelspacher, 2000: 76, 141, 152, map 50; Lourenço and Sissom, 2000: 135, appendix 5.1; Sissom, 2000: 530, 531; González-Santillán, 2004: 25, 26, 27, 31, 34, fig. 3, table 1; Francke and Ponce-Saavedra, 2005: 63, 66, 67, figs. 10, 12, 13; Soleglad and Fet, 2008: 89, 99; Ponce-Saavedra and Francke, 2011: 466, table 1.

Konetontli chamelaensis (Williams, 1986): González-Santillán and Prendini, 2013: 35, 36.

TYPE MATERIAL: **MEXICO: Jalisco:** *Municipio de La Huerta*: Holotype ♂ (CAS, Type No. 15744), 7 ♂, 1 ♀ paratypes (CAS, Type No. 15744), Estación de Biología, Chamela, 10–13.vii.1985, S.C. Williams.

DIAGNOSIS: *Konetontli chamelaensis* is closely related to *K. ilitchi*, sp. nov., *K. migrus*, sp. nov., *K. nayarit*, and *K. pattersoni*, with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of granular ventral submedian carinae on metasomal segments I–IV and 11 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli chamelaensis* is the sister species of *K. ilitchi*, sp. nov., with which it shares complete, granular ventral lateral carinae on metasomal segments I–IV and a simple subaculear tubercle on the telson. The two species are also similar in size, with total length (female) ca. 16 mm, but differ in the following respects. The ventral lateral and ventral submedian metasomal carinae of metasomal segments I–V are completely infuscate in *K. ilitchi*, sp. nov., but infuscate only around the bases of the macrosetae in *K. chamelaensis*. The telson ventral surface is finely and sparsely granular in *K. chamelaensis*, but uniformly coarsely granular in *K. ilitchi*, sp. nov. The pedipalp femur dorsal retrolateral carina is partially infuscate in *K. chamelaensis*, but completely infuscate in *K. ilitchi*, sp. nov. The pedipalp chela manus is immaculate in *K. chamelaensis* whereas the manus intercarinal surfaces are diffusely infuscate and the carinae markedly infuscate in *K. ilitchi*, sp. nov.

Konetontli chamelaensis differs further from *K. ilitchi*, sp. nov., and the other three species as follows. The median denticle row of the pedipalp chela movable finger possesses five denticle subrows with five retrolateral denticles in *K. chamelaensis*, but six of each in *K. ilitchi*, sp. nov., *K. migrus*, sp. nov., *K. nayarit*, and *K. pattersoni*. The pedipalp femur prolateral dorsal and dorsal retrolateral carinae are obsolete and the pedipalp chela slender in *K. chamelaensis*, whereas the femur prolateral dorsal and dorsal retrolateral carinae are granular and the chela incrassate in *K. migrus*, sp. nov. *Konetontli chamelaensis* is smaller, with total length ca. 11–13 mm, than *K. nayarit* and *K. pattersoni*, with total lengths ca. 19–25 mm.

DESCRIPTION: The following redescription, which is based on the type material and additional material examined, supplements Williams' (1986) original description.

Color and infuscation: Cheliceral manus dorsal surface and fixed and movable fingers immaculate. Carapace base color yellow-orange, entirely infuscate. Pedipalps

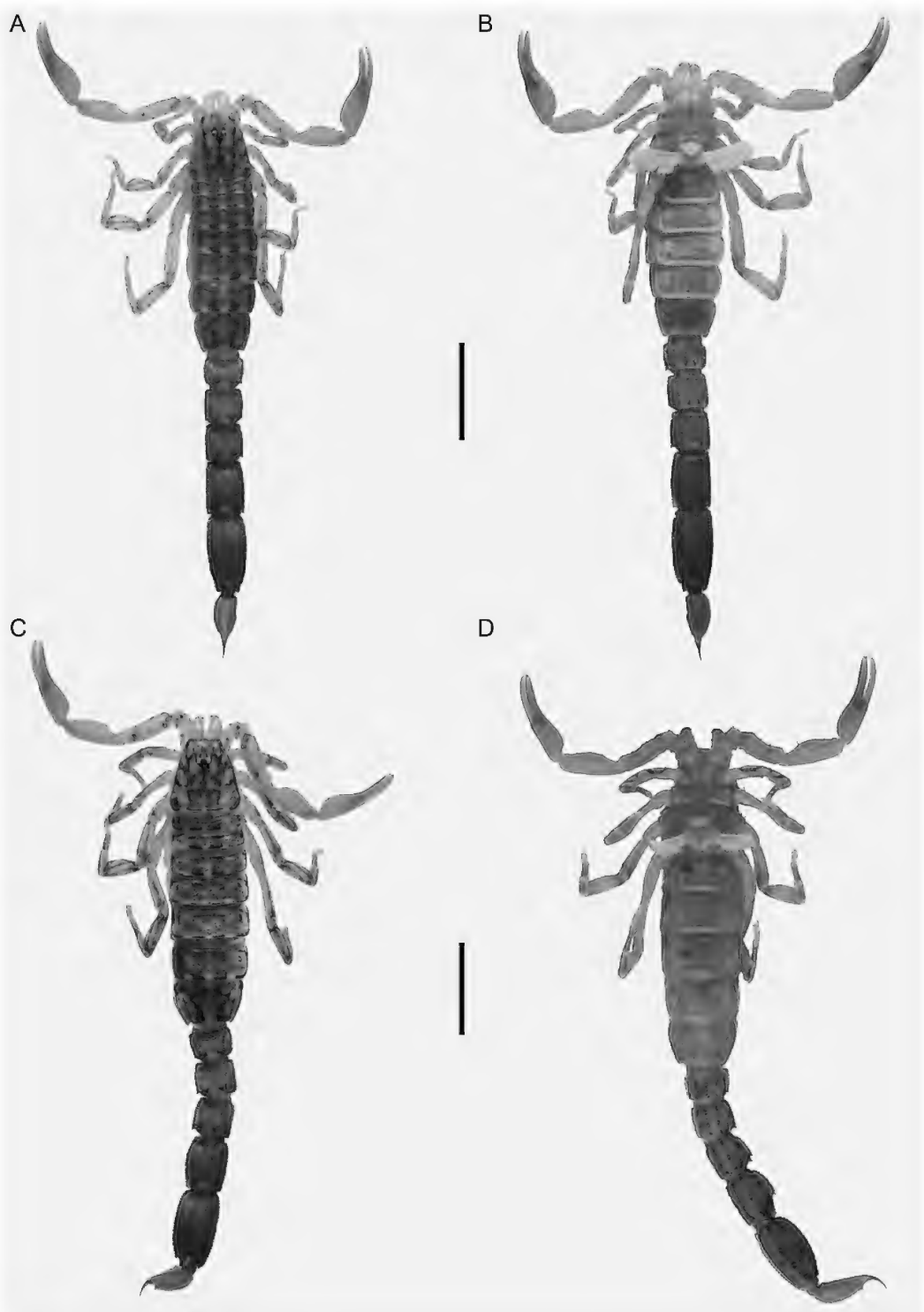

Fig. 20. *Konetontli chamelaensis* (Williams, 1986), habitus. **A**, **B**. Holotype ♂ (CAS). **C**, **D**. ♀ (CNAN). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 2.5 mm.

base color yellow, carinae immaculate, fingers weakly infuscate proximally. Legs base color yellow. Coxosternal region, genital operculum, and pectines immaculate. Mesosoma base color yellow-orange, entirely infuscate; tergites I–VII dorsal median surface immaculate, dorsal lateral carinae infuscate; sternites III–VI ventral surfaces immaculate; VII infuscate around bases of macrosetae. Metasomal segments base color yellowish to reddish brown, becoming darker posteriorly, all carinae partially infuscate, especially around bases of macrosetae. Telson vesicle base color orange-brown, paler than metasomal segment V; aculeus reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 11–12 tines, in distal half.

Carapace: Length 1.2 times greater than posterior width (table 2). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 5B). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace, superciliary carinae costate. Median ocelli approximately three times the size of anterolateral ocelli. Anteromedian, posterolateral, and posterior transverse sulci obsolete; posteromedian sulcus shallow, narrow. Surfaces matte, uniformly finely granular.

Coxosternal region: Sternum subequilateral pentagonal, 1.5 times wider than long (table 2); median sulcus deep; ventral surfaces matte, with three pairs of macrosetae (fig. 9E). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa II proximal margin uniformly finely granular, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with shallow depression, medial margin smooth. Coxa IV length 1.25 times greater than coxa II length (table 2).

Pedipalps: Femur intercarinal surfaces matte (fig. 21A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae granular; retrolateral dorsosubmedian carina obsolete, demarcated by two macrosetae medially; retrolateral ventral, ventral median, and prolateral ventral carinae obsolete, prolateral ventral carina demarcated by three macrosetae; prolateral ventrosubmedian granular with one macroseta medially. Patella width 1.2 times greater than femur width (table 2); intercarinal surfaces matte (fig. 21 B–E); dorsal prolateral and ventral prolateral carinae granular; dorsal retrolateral, ventral retrolateral, ventral retrosubmedian and ventral median carinae obsolete; all carinae on retrolateral surface obsolete; prolateral ventral carina obsolete, delimited by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.5 times greater than patella length, 1.6 times greater than femur length (table 2); width 1.1 times greater than patella width, 1.4 times greater than femur width. Manus fairly slender (fig. 21F–I); retrolateral intercarinal surfaces smooth proximally, finely and sparsely granular distally; other intercarinal surfaces smooth; carinae obsolete. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising five denticle subrows flanked by five prolateral and retrolateral denticles, proximal two retrolateral denticles separated from subrows; movable finger median denticle row comprising five denticle subrows, flanked by seven prolateral denticles and five retrolateral denticles, proximal two retrolateral denticles separated from medial rows, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi prolateral ventral and retrolateral ventral spinule rows partial, restricted to distal half on legs I and II, prolateral ventral row absent, retrolateral ventral row vestigial, reduced to few spinules at distal end on III (fig. 15B), prolateral

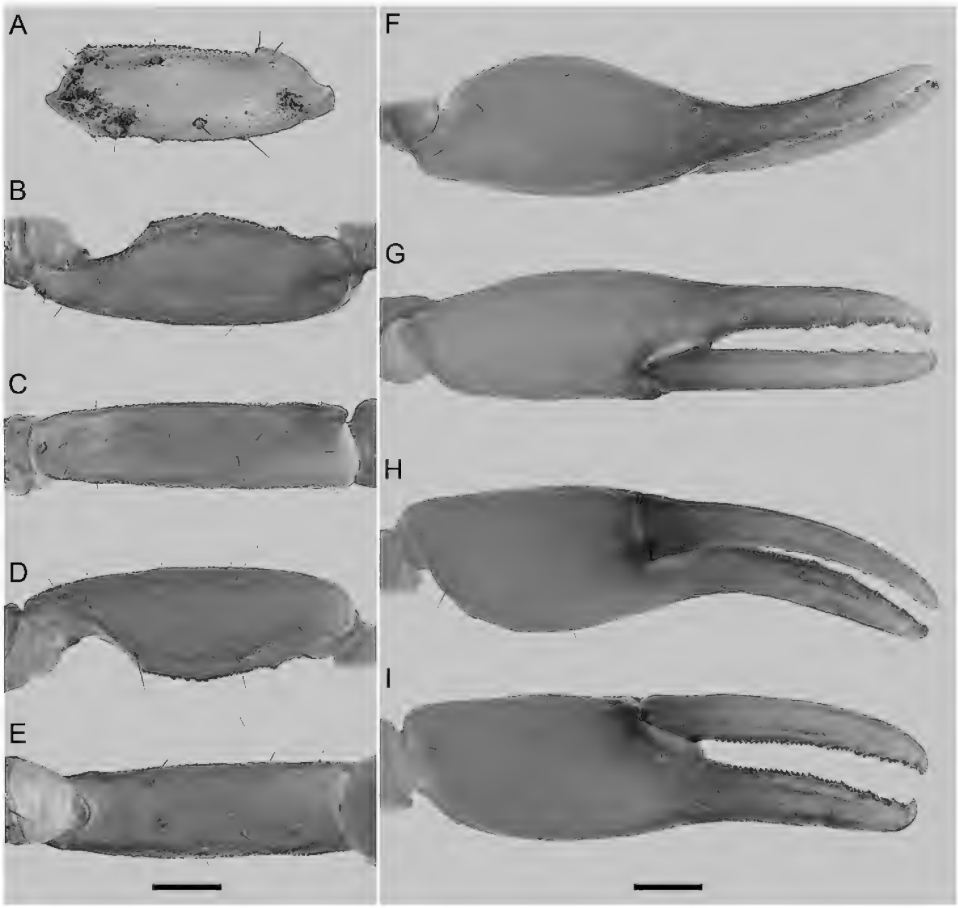

Fig. 21. *Konetontli chamelaensis* (Williams, 1986), holotype ♂ (CAS), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.25 mm.

ventral and retrolateral ventral rows absent on IV; retrolateral median and retrolateral dorsal rows absent on I–IV; macrosetal counts on I–IV, respectively: dorsal, 2:2:2:2; retrolateral dorsal, 3:3:3:3; retrolateral ventral, 3:3:3:3; prolateral ventral, 3:3:4:4, medial two macrosetae spiniform on III and IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 9E), with three pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 2.5 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16C). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 16D). Hemimating plug developed from inner lobe, distal barb margin with approximately 12 short spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.43 times basal plate length (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 9E). Marginal lamella

comprising three sclerites. Medial lamella proximal two or three sclerites fused, eight separate. Fulcra, 10–10. Pectinal teeth, 10–11 (♂), 10 (♀). Pectines relatively short, midpoint (♂) or distal margin (♀) of third (distal) sclerite of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte (fig. 20A, C), dorsal median carinae complete, costate, dorsal lateral carinae vestigial, comprising few granules posteriorly; VII intercarinal surfaces shagreened, dorsal median carina partial, restricted to anterior half of segment, costate, dorsal sublateral carinae vestigial, comprising few serrate granules restricted to anterior half of segment, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth (fig. 20B, D), spiracles minute, slitlike, three times longer than wide; V ventral surface without hyaline glandular area posteromedially; VII intercarinal surfaces smooth, without hyaline glandular area posteromedially, carinae obsolete, lateral ventral carinae each with one pair of macrosetae, ventral lateral and ventral submedian carinae each with two pairs of macrosetae.

Metasoma: Metasoma length 1.6 times greater than mesosoma length (table 2); segment I width 1.3 times greater than length; II width 1.1 times greater than length; III width slightly greater than or equal to length; V width 1.8 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 10B, 11B); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, partial, restricted to anterior half, costate-granular on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior half, granular on II, partial, restricted to posterior two-thirds, granular on III, absent on IV and V; ventral lateral carinae complete, granular on I–V; ventral submedian carinae complete, costate-granular on I, complete, granular on II–IV, obsolete on V; ventral median carina complete, granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 1:1:1:1:4; lateral median carinae, 1:1:1:0:2; lateral inframedian carinae, 0:0:0:0:0; ventral lateral carinae, 2:2:2:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:2.

Telson: Vesicle slightly elongate; length 2.9 times greater than width, 2.2 times greater than aculeus length (table 2). Dorsal surface finely and sparsely granular. Ventral surface carinae obsolete, each with three or four pairs of macrosetae; ventral median carina with four pairs of macrosetae; subaculear tubercle simple, conical, slightly sharp (fig. 14B). Aculeus laterobasal microserration comprising 4/4 spinules.

DISTRIBUTION: *Konetontli chamelaensis* is known only from the type locality in coastal Jalisco, Mexico (fig. 1). The topography at the type locality is fairly homogeneous, ranging from 10 to 580 m altitude (the only altitude record for this species is 97 m). The dominant vegetation is tropical deciduous forest on predominantly sandy soils derived from basalt, rhyolite, and conglomerate. The climate is markedly seasonal, the dry season extending from July to November and the rainy season from December to January, with little rain from February to June.

ECOLOGY: Williams (1986) collected the type series, comprising eight males and one female, at night with UV light detection in July, which may have coincided with the reproductive cycle of this species. The habitat was described as dense, deciduous tropical forest with stands of cacti in the high, more exposed areas, on moderately well drained, flat sedimentary, finely textured, and well packed soil. Williams (1986) suggested that *K. chamelaensis* is fossorial. However, González-Santillán (2004) collected two specimens of *K. chamelaensis* inside decaying logs, situated in a shaded, relatively humid microhabitat. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001). *Konetontli chamelaensis* is sympatric with two buthids, *Centruroides elegans* (Thorell, 1876) and *Centruroides chamelaensis* Ponce-Saavedra and Francke, 2011, and two vaejovids, *Thorellius intrepidus* (Thorell, 1876) and an undescribed species of *Mesomexovis*.

REMARKS: Williams (1986) described this species in the genus *Vaejovis* and assigned it to the *eusthenura* group, where it remained until Lourenço and Sissom (2000) listed it in the *mexicanus* group. It was transferred to *Konetontli* by González-Santillán and Prendini (2013).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Jalisco:** *Municipio de La Huerta*: Estación de Biología UNAM, Chamela, 23.iv.1980, S.H. Bullok, 1 ♀ (CNAN SC3850), 24.iv.1993, 2 ♀ (CNAN), 31.v.1990, N. Martínez, 1 ♀ (CNAN SC3848), 1.vi.1994, N. Martigera, 2 ♀ (CNAN), Vereda Verdin, 23.x.2001, E. González and J.L. Castelo, 1 ♂ (CNAN SC3849), 24.x.2005, 1 ♂, 1 ♀ (CNAN), 19°29.875′N 105°02.608′W, 97 m, 30.viii.2007, O.F. Francke et al., 2 juv. (AMNH [LP 7675]), Rincón de Ixtlán [19°32′N 105°04′W], 24.x.2001, E. González, 1 ♀ (CNAN SC3851), 25.x.2005, 1 ♀ (CNAN).

Konetontli ignes, sp. nov.
Figures 2, 5C, 9A, 10C, 11C, 14C, 15C, 16E, F, 22A, B, 23; tables 1–3

TYPE MATERIAL: **MEXICO: Guerrero:** *Municipio de Copala*: Holotype ♀ (CNAN T0885), paratype ♀ (AMNH), Microwave Tower Fogos [ca. 10 km SE of Copala, 1 km from Mexico Route 200, between Copala and Marquelia], 16°34.052′N 98°53.252′W, 139 m, 31.viii.2008, O.F. Francke, H. Montaño, C. Santibáñez, and A. Valdez; 3 ♀ paratypes (CNAN T0886), Microwave Tower Fogos, 16°33.992′N 98°53.301′W, 103 m, 22.vi.2007, O.F. Francke, H. Montaño, L. Escalante, and J.A. Ballesteros.

ETYMOLOGY: The species name *ignes* is a noun in apposition derived from the name of the type locality. The Portuguese noun *fogos* is translated to the Latin *ignes*, which means "fires."

DIAGNOSIS: *Konetontli ignes*, sp. nov., is closely related to *K. acapulco*, *K. juxtlahuaca*, sp. nov., *K. kuarapu*, and *K. zihuatanejensis*, comb. nov., with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of obsolete ventral submedian carinae on metasomal segments I–IV, and 14 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli ignes*, sp. nov., is the sister species of *K. juxtlahuaca*, sp. nov., with which it shares vestigial lateral median carinae and obsolete ventral lateral carinae on metasomal segments III and IV, and a slender pedipalp chela manus, narrower than the patella. The two species differ in the following respects. The pedipalp femur dorsal prolateral carina is obsolete, smooth and infuscate distally in *K. ignes*, sp. nov., but granular and markedly infuscate in *K. juxtlahuaca*, sp. nov. The pedipalp patella carinae and dorsal and retrolateral surfaces are almost immaculate in *K. ignes*, sp. nov., but markedly infuscate in *K. juxtlahuaca*, sp. nov. The median denticle row of the pedipalp chela fingers possesses five denticle subrows with five retrolateral denticles in *K. ignes*, sp. nov., but six in *K. juxtlahuaca*, sp. nov. The pedipalp chela carinae and intercarinal surfaces are markedly infuscate in *K. ignes*, sp. nov., whereas only the chela fingers are infuscate in *K. juxtlahuaca*, sp. nov.

Konetontli ignes, sp. nov., differs further from *K. juxtlahuaca*, sp. nov., and the other three species as follows: the median denticle row of the pedipalp chela movable finger possesses five denticle subrows with five retrolateral denticles in *K. ignes*, sp. nov., but six in *K. kuarapu* and *K. juxtlahuaca*, sp. nov., and seven in *K. acapulco* and *K. zihuatanejensis*, comb. nov.

DESCRIPTION: The following description is based on the type material and additional material examined.

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate. Carapace base color yellowish brown, entirely infuscate. Pedipalps base color yellowish brown; femur dorsal and retrolateral intercarinal surfaces, and dorsal retrolateral carina infuscate; patella infuscate around bases of trichobothria eb_1–eb_5; chela manus carinae infuscate, intercarinal surfaces less densely infuscate, fingers infuscate proximally to midfinger. Legs base color yellowish brown, retrolateral surfaces infuscate. Coxosternal region, genital operculum, and pectines immaculate. Mesosoma base color yellowish brown, entirely infuscate; tergites I–VII dorsal median carinae immaculate, dorsal lateral carinae infuscate; sternites III–VI

TABLE 2

Measurements (mm) of *Konetontli acapulco* (Armas and Martín-Frías, 2001), *Konetontli chamelaensis* (Williams, 1986), *Konetontli ignes*, sp. nov., and *Konetontli ilitchi*, sp. nov., Deposited at the American Museum of Natural History, New York (AMNH) and the Colección Nacional de Arácnidos, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (CNAN)

Species		*K. acapulco*		*K. chamelaensis*			*K. ignes*				*K. ilitchi*	
Collection		CNAN	CNAN	CNAN	CNAN	CNAN	CNAN		CNAN		CNAN	AMNH
Number		T0174	SC3878	SC3849	SC3850	SC3851	T0885		T0886		T0887	
Type		Holo.					Holo.		Para.		Holo.	Para.
Sex		♂	♀	♂	♀	♀	♀	♀	♀	♀	♀	♀
Carapace	length	3.1	3.45	1.68	1.63	1.85	1.98	2.0	1.83	1.98	2.2	2.23
	ant. width	1.65	1.75	0.9	0.88	1.0	1.05	1.05	1.03	1.03	1.03	1.2
	post. width	2.8	3.15	1.55	1.5	1.68	1.78	1.75	1.73	1.75	2.0	2.13
Femur	length	2.65	2.7	1.15	1.18	1.35	1.3	1.33	1.25	1.3	1.55	1.6
	width	1.0	0.7	0.4	0.38	0.48	0.5	0.5	0.5	0.5	0.55	0.58
Patella	length	3.0	3.1	1.38	1.38	1.58	1.63	1.65	1.55	1.63	1.95	1.93
	width	1.1	1.1	0.5	0.5	0.55	0.63	0.63	0.58	0.63	0.7	0.75
Chela	length	5.0	4.7	2.08	2.03	2.25	2.35	2.33	2.25	2.25	2.75	2.95
Manus	width	1.45	1.3	0.63	0.48	0.55	0.53	0.53	0.53	0.5	0.7	0.78
Manus	height	1.3	1.15	0.53	0.45	0.5	0.5	0.53	0.48	0.5	0.6	0.7
Fixed finger	length	2.3	2.3	0.93	0.93	1.05	1.05	1.13	1.05	1.0	1.35	1.45
Mov. finger	length	2.95	2.9	1.25	1.25	1.38	1.38	1.38	1.3	1.33	1.75	1.85
Coxa II	length	1.25	1.35	0.63	0.65	0.73	0.75	0.73	0.75	0.75	0.83	0.88
Coxa IV	length	2.5	2.6	1.2	1.38	1.48	1.5	1.45	1.5	1.48	1.68	1.83
Sternum	length	0.75	0.65	0.3	0.38	0.4	0.4	0.4	0.4	0.4	0.4	0.65
	width	0.8	1.0	0.55	0.6	0.58	0.63	0.58	0.58	0.58	0.63	0.4
Mesosoma	length	7.15	8.0	3.38	3.1	4.1	4.4	4.38	4.08	4.4	4.9	4.43
Metasoma	length	11.3	10.4	5.43	5.0	5.58	5.53	5.73	5.33	5.4	6.65	6.85
Segment I	length	1.5	1.25	0.65	0.58	0.63	0.63	0.68	0.63	0.65	0.8	0.83
	width	2.0	2.0	1.08	1.0	1.15	1.2	1.23	1.18	1.2	1.25	1.3
	height	1.35	1.5	0.6	0.73	1.0	1.0	0.88	1.0	1.0	1.05	1.0
Segment II	length	1.8	1.6	0.78	0.75	0.8	0.8	0.8	0.78	0.8	0.95	0.95
	width	2.0	2.0	0.98	0.95	1.1	1.18	1.23	1.13	1.18	1.25	1.3
	height	1.35	1.55	0.6	0.68	0.98	0.98	0.83	1.0	1.0	1.05	1.0
Segment III	length	1.9	1.8	0.85	0.8	0.88	0.85	0.88	0.8	0.75	1.0	1.08
	width	2.0	2.0	0.98	0.93	1.05	1.18	1.23	1.13	1.18	1.25	1.3
	height	1.45	1.5	0.58	0.68	1.0	1.0	0.85	1.0	1.0	1.05	1.0
Segment IV	length	2.65	2.5	1.28	1.15	1.3	1.38	1.38	1.25	1.28	1.6	1.6
	width	2.0	2.0	0.95	0.9	1.05	1.13	1.2	1.13	1.18	1.2	1.28
	height	1.6	1.45	0.83	0.7	1.05	1.0	0.95	1.0	1.0	1.05	1.03
Segment V	length	3.45	3.25	1.88	1.73	1.98	1.88	2.0	1.88	1.93	2.3	2.4
	width	2.1	2.0	1.0	0.95	1.18	1.2	1.25	1.13	1.23	1.15	1.33
	height	1.75	1.5	0.83	0.73	1.0	1.0	1.0	1.0	1.0	1.05	1.05
Telson	length	4.05	3.1	1.65	1.55	1.75	2.0	1.88	1.8	1.83	2.15	2.2
Vesicle	length	2.05	2.1	0.55	1.0	1.18	1.35	1.25	1.23	1.3	1.5	1.5
	width	1.6	1.6	0.6	0.63	0.65	0.9	0.68	0.83	0.88	0.85	0.88
	height	1.05	1.15	0.58	0.45	0.5	0.63	0.65	0.63	0.63	0.6	0.75
Aculeus	length	2.0	1.0	1.1	0.55	0.58	0.65	0.63	0.58	0.53	0.65	0.7
Total	length	25.6	24.95	12.13	11.28	13.28	13.9	13.98	13.03	13.6	15.9	15.7

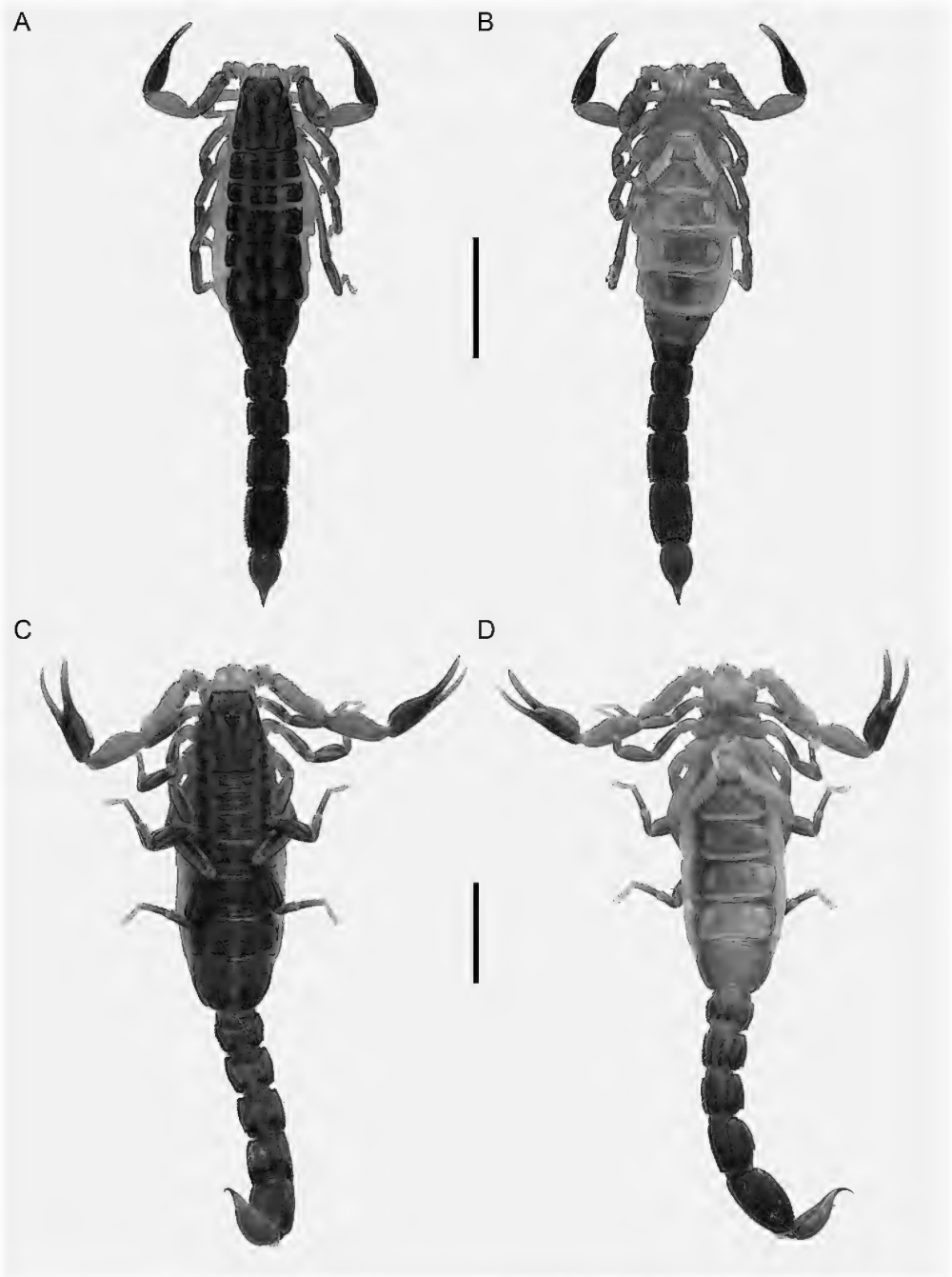

Fig. 22. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885) (**A**, **B**) and *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN) (**C**, **D**), habitus. **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 2.5 mm.

ventral surfaces immaculate; VII infuscate medially and around bases of macrosetae. Metasoma base color yellowish brown, segments uniform; carinae infuscate, most intercarinal surfaces infuscate on I–V. Telson vesicle base color reddish orange, paler than metasomal segment V; aculeus reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 16 tines, in distal half.

Carapace: Length 1.2 times greater than posterior width (table 2). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 5C). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian and posteromedian sulci shallow, narrow; anterolateral and posterolateral sulci shallow; posterior transverse sulci obsolete. Surfaces matte, uniformly finely granular; posterolateral sulci smooth.

Coxosternal region: Sternum subequilateral pentagonal; 1.6 times wider than long (table 2); median sulcus deep; ventral surfaces smooth; with three pairs of macrosetae (fig. 9A). Coxae ventral surfaces matte (♂) or entirely smooth (♀). Coxa II proximal margin uniformly finely granular, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite, proximal margin with shallow depression, medial margin smooth. Coxa IV length 1.88 times greater than coxa II length (table 2).

Pedipalps: Femur intercarinal surfaces matte (fig. 23A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae obsolete; retrolateral dorsosubmedian carina obsolete, demarcated by three macrosetae medially; retrolateral ventral and ventral median carinae obsolete; prolateral ventral carina vestigial, reduced to spiniform granule and two minor macrosetae proximally; prolateral ventrosubmedian carina obsolete, demarcated by two macrosetae medially. Patella width equal to femur width (table 2); prolateral median and dorsal prolateral intercarinal surfaces matte, other intercarinal surfaces smooth (fig. 23B–E); dorsal prolateral, ventral prolateral, dorsal retrolateral, and ventral retrosubmedian carinae obsolete, smooth; retrolateral median and ventral median carinae obsolete; prolateral ventral carina obsolete, demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.3 times greater than patella length and 1.4 times greater than femur length (table 2); width equal to patella width and femur width. Manus fairly slender (fig. 23 F–I); intercarinal surfaces smooth; carinae obsolete. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising five denticle subrows flanked by four prolateral denticles and five retrolateral denticles, proximal prolateral denticle situated in distal half of finger, proximal retrolateral denticle situated midfinger; movable finger median denticle row comprising five denticle subrows, flanked by five prolateral denticles and five retrolateral denticles, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi retrolateral dorsal, retrolateral ventral, and prolateral ventral spinule rows complete on legs I and II, absent on IV (fig. 15C); retrolateral dorsal and retrolateral ventral rows partial, restricted to distal two-thirds, prolateral ventral row partial, restricted to distal third on III; retrolateral median rows vestigial, reduced to few distal spinules on I–IV; macrosetal counts on I–IV, respectively: dorsal and retrolateral dorsal, 2:2:2:2; retrolateral ventral, 3:4:4:4; prolateral ventral, 3:3:4:5, proximal two macrosetae subspiniform on III, spiniform on IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long, with three pairs of macrosetae (fig. 9A); sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital

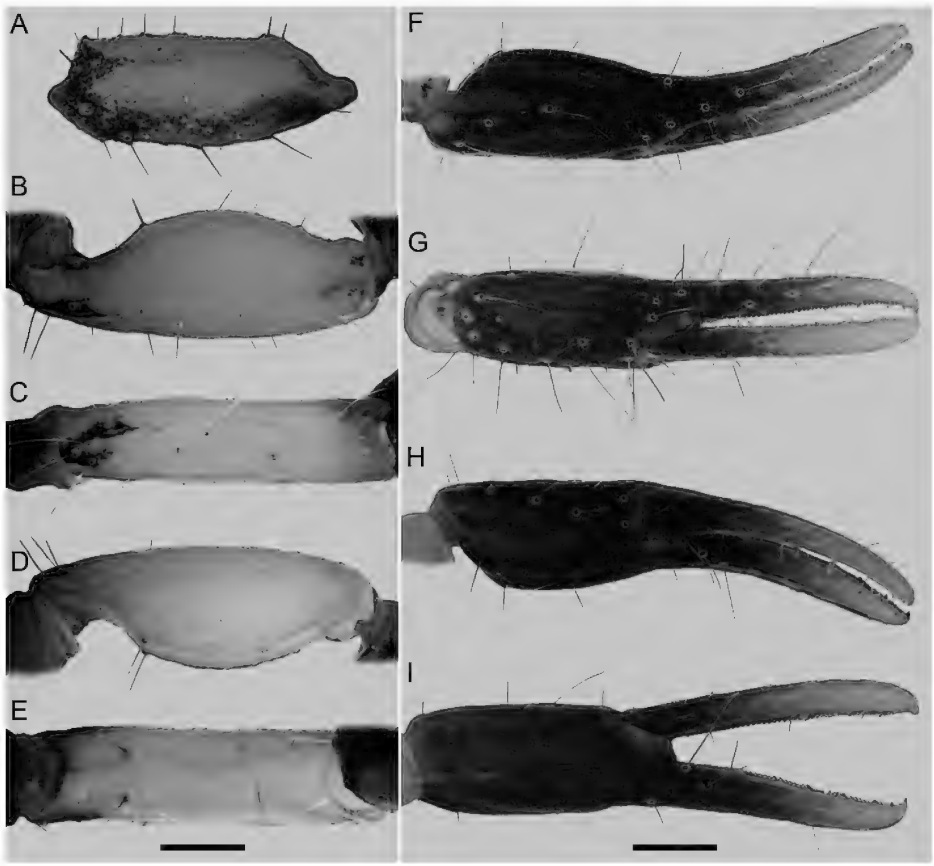

Fig. 23. *Konetontli ignes*, n. sp., holotype ♀ (CNAN T0885), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 1.6 times length of trunk (table 3). Median lobe ental terminus well developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16E). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 16F). Hemimating plug developed from inner lobe, distal barb margin with approximately 12 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.29 times basal plate length (table 3).

Pectines: Basal piece with five pairs of macrosetae (fig. 9A). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, five sclerites separate. Fulcra, 8/8. Pectinal teeth, 9/9 (♀). Pectines relatively long, third (distal) sclerite of marginal lamella extending past distal margin of coxa IV.

Tergites: Tergites I–VII intercarinal surfaces matte (fig. 22A); I–VI dorsal median carinae complete, costate, dorsal lateral carinae vestigial, comprising few granules posteriorly; VII intercarinal surfaces shagreened, dorsal median carina partial, restricted to anterior half of segment, costate, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth (fig. 22B), spiracles minute, slitlike, twice as long as wide; V ventral surface without hyaline glandular area posteromedially; VII

intercarinal surfaces smooth, with small, weakly developed hyaline glandular area posteromedially, carinae obsolete, lateral ventral carinae each with one pair of macrosetae, ventral lateral and ventral submedian carinae each with two pairs of macrosetae.

Metasoma: Total length 1.3 times greater than mesosoma length (table 2); segment I width 1.8 times greater than length; II width 1.6 times greater than length; III width 1.4 times greater than length; V width 1.2 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 10C, 11C); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, reduced to few granules anteriorly on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior half, granular on II, partial, restricted to posterior third, granular on III, absent on IV and V; ventral lateral and ventral submedian carinae obsolete on I–III, vestigial, reduced to few granules posteriorly, on IV; ventral lateral and ventral median carinae partial, restricted to posterior half, granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:0:0:1:4; lateral median carinae, 0:1:1:2:5; lateral inframedian carinae, 2:2:2:2:0; ventral lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:2.

Telson: Vesicle slightly elongate; length 2.1 times greater than width, 2.2 times greater than aculeus length (table 2). Dorsal surface smooth. Ventral surface carinae obsolete, smooth, each with three pairs of macrosetae; ventral median carina with four pairs of macrosetae; subaculear tubercle simple, conical, blunt (fig. 14C). Aculeus laterobasal microserration comprising 3–3 spinules.

DISTRIBUTION: *Konetontli ignes*, sp. nov., is known only from the type locality in coastal Guerrero, Mexico (fig. 1).

ECOLOGY: The known specimens were collected in a tropical deciduous forest at 14 to 139 m altitude, using UV light detection at night, by searching under rocks and disturbing leaf litter. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Guerrero:** *Municipio de Copala*: Microwave Tower Fogos [ca. 10 km SE of Copala, 1 km from Mexico Route 200, between Copala and Marquelia], 16°33.992′N 98° 53.301′W, 103 m, 26.vi.2007, 1 juv. (CNAN), [leg] (AMNH [LP 6993]), O.F. Francke, H. Montaño, L. Escalante, and J.A. Ballesteros; 16°34.360′N 98°53.423′W, 14 m, 2.xi.2007, 1 ♂ (AMNH [LP 8584]), O.F. Francke, H. Montaño, L. Escalante, and J.A. Ballesteros; 16°34.052′N 98°53.252′W, 139 m, 31.viii. 2008, O.F. Francke, H. Montaño, C. Santibáñez, and A. Valdez, 1 juv. (AMNH [LP 9527]).

Konetontli ilitchi, sp. nov.
Figures 2, 4D, 8D, 10D, 11D, 15D, 22C, D, 24; tables 1, 2

TYPE MATERIAL: **MEXICO: Colima:** *Municipio de Coquimatlán*: Holotype ♀ (CNAN T0887), paratype ♀ (AMNH), Coquimatlán, 8 km S, 19°09.061′N 103°50.080′W, 277 m, 2007–2008, H. Montaño, A. Valdez, O.F. Francke, and N. Perez, inside a cave.

ETYMOLOGY: The species name *ilitchi*, an adjective in Yaqui language that means "small" and refers to the small size of this species, is a noun in apposition.

DIAGNOSIS: *Konetontli ilitchi*, sp. nov., is closely related to *K. chamelaensis*, *K. migrus*, sp. nov., *K. nayarit*, and *K. pattersoni*, with which it forms a monophyletic group, sister to the other five species of *Konetontli*, united by the presence of granular ventral submedian carinae on metasomal segments I–IV, and 11 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli ilitchi*, sp. nov., is the sister species of *K. chamelaensis* with which it shares complete, granular ventral lateral carinae on metasomal segments I–IV and a simple subaculear tubercle on the telson. The two species are also similar in size, with total length (♀) ca. 16 mm, but differ in the following respects. The ventral lateral and ventral submedian metasomal carinae of metasomal segments I–V are completely infuscate in *K. ilitchi*, sp. nov., but infuscate only around the bases of the

macrosetae in *K. chamelaensis*. The telson ventral surface is uniformly coarsely granular in *K. ilitchi*, sp. nov., but finely and sparsely granular in *K. chamelaensis*. The pedipalp femur dorsal retrolateral carina is completely infuscate in *K. ilitchi*, sp. nov., but partially infuscate in *K. chamelaensis*. The pedipalp chela manus intercarinal surfaces are diffusely infuscate and the carinae markedly infuscate in *K. ilitchi*, sp. nov., whereas the chela is immaculate in *K. chamelaensis*. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. ilitchi*, sp. nov., but five in *K. chamelaensis*. *Konetontli ilitchi*, sp. nov., is smaller, with total length ca. 15–16 mm, than *K. nayarit* and *K. pattersoni*, with total lengths ca. 19–25 mm.

Konetontli ilitchi, sp. nov., differs further from *K. migrus*, sp. nov., *K. nayarit*, and *K. pattersoni*, in the following respects. The pedipalp chela is slender in *K. ilitchi*, sp. nov., whereas the chela is incrassate in the other three species. The pedipalp chela carinae are markedly infuscate in *K. ilitchi*, sp. nov., almost immaculate in *K. migrus*, sp. nov., and partially infuscate distally on the manus in *K. nayarit* and *K. pattersoni*. The subaculear tubercle of *K. ilitchi*, sp. nov., is simple with a single relatively small spiniform tubercle, rather than compound, with multiple secondary tubercles along the ventral median carina of the vesicle, as in *K. migrus*, sp. nov., and *K. nayarit*. The lateral median carinae are restricted to the anterior two-thirds of metasomal segment V in *K. ilitchi*, sp. nov., but to the anterior third in *K. pattersoni*.

DESCRIPTION: The following description is based on the holotype and the paratype. The male of this species is unknown.

Color and infuscation: Cheliceral manus dorsal surface and fixed finger infuscate, movable finger infuscate proximally. Carapace base color yellowish orange, entirely infuscate. Pedipalps base color orange-brown; femur, infuscate around bases of trichobothria *i*, *e*, and *d*; patella infuscate around bases of trichobothria eb_1–eb_5; chela manus carinae infuscate, intercarinal surfaces less densely infuscate, fingers infuscate in proximal half. Legs base color yellowish orange, retrolateral surfaces infuscate. Coxosternal region and genital operculum immaculate, pectines faintly infuscate. Mesosoma base color yellowish orange, entirely infuscate; tergites I–VII dorsal median carinae and dorsal submedian intercarinal surfaces immaculate, dorsal lateral carinae infuscate; sternites III–VII ventral surfaces immaculate, lateral margins infuscate; VII lateral ventral, ventral lateral, and ventral submedian carinae infuscate around bases of macrosetae. Metasoma base color yellowish orange, segments III–V darker than I and II; lateral intercarinal surfaces infuscate on I–IV; ventral lateral and ventral submedian carinae infuscate on I–IV; ventral sublateral carinae infuscate around bases of macrosetae in posterior half of V; ventral median carina immaculate, but infuscate around bases of lateral macrosetae on V. Telson vesicle base color orange, paler than metasomal segment V; aculeus dark reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 12–15 tines, in distal half.

Carapace: Length 1.1 times greater than posterior width (table 2). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 5D). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus shallow with anterior depression; posteromedian and posterolateral sulci shallow; anterolateral and posterior transverse sulci obsolete. Surfaces shagreened, mostly uniformly finely granular with few scattered coarse granules.

Coxosternal region: Sternum subequilateral pentagonal; 1.8 times wider than long (table 2); median sulcus deep; ventral surfaces smooth; with four pairs of macrosetae (fig. 8D). Coxae ventral surfaces entirely smooth. Coxa II proximal margin entirely smooth, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with shallow depression, medial margin

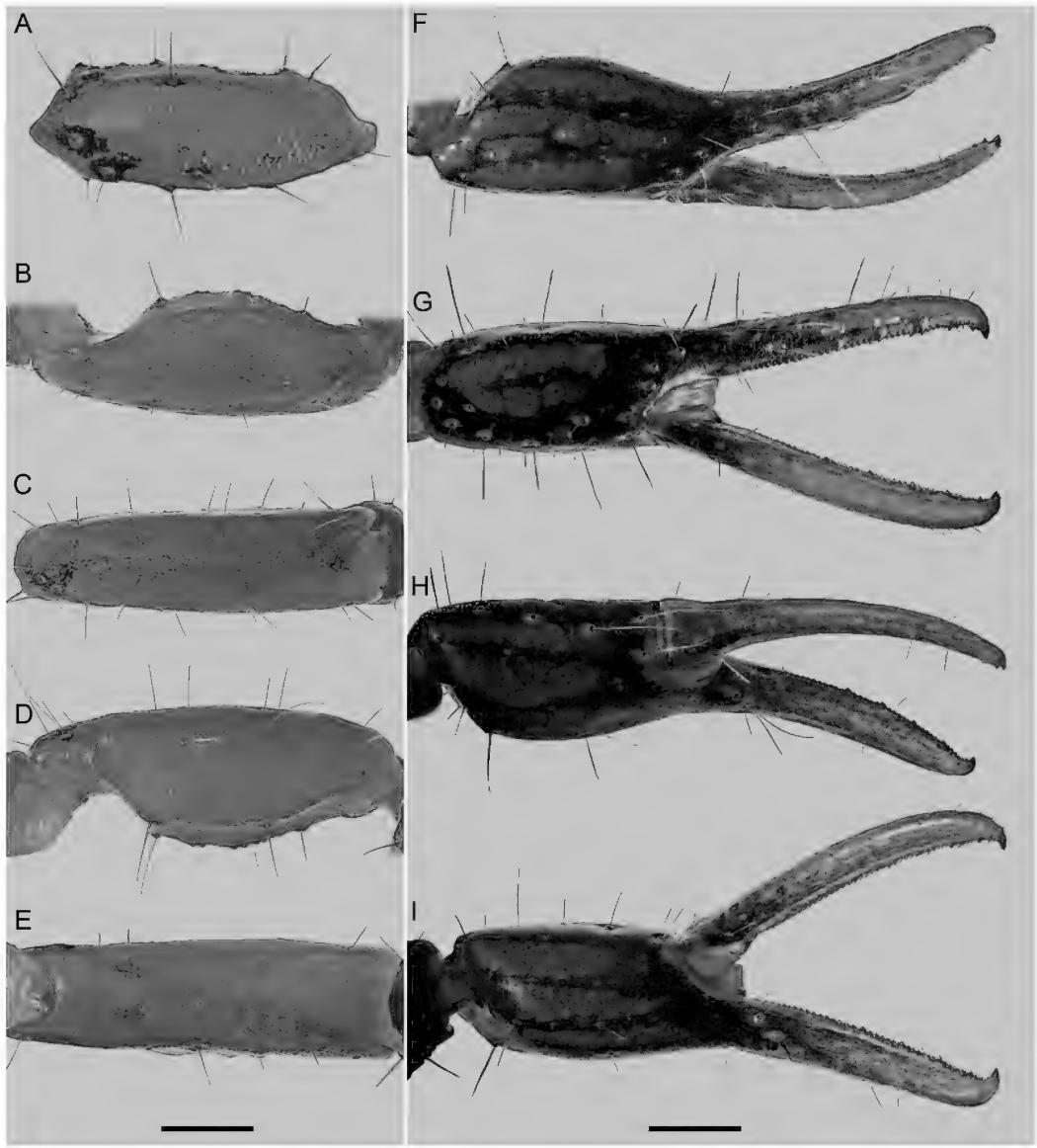

Fig. 24. *Konetontli ilitchi*, n. sp., holotype ♀ (CNAN T0887), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect.**C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

smooth. Coxa IV length 2.3 times greater than coxa II length (table 2).

Pedipalps: Femur intercarinal surfaces matte (fig. 24A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina obsolete, demarcated by three macrosetae medially; retrolateral ventral carina absent; ventral median carina vestigial, reduced to few granules proximally; prolateral ventral carina vestigial, reduced to subdistal granule and three macrosetae; prolateral ventrosubmedian carina partial, restricted to proximal three quarters of segment and reduced to three spiniform granules, proximally, medially, and distally, and one macroseta medially. Patella width 1.3 times greater than femur width (table 2);

intercarinal surfaces smooth (fig. 24B–E); dorsal prolateral and ventral retrosubmedian carinae complete, granular; retrolateral carinae absent; ventral retrolateral carina obsolete; ventral prolateral carina complete, granular; ventral median carina partial, costate, restricted to proximal two-thirds of segment; prolateral ventral carina obsolete, demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.4 times greater than patella length, 1.8 times greater than femur length (table 2); width equal to patella width, 1.3 times greater than femur width. Manus fairly slender (fig. 24F–I); retrolateral intercarinal surfaces smooth; carinae obsolete. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising five denticle subrows flanked by six prolateral denticles and five retrolateral denticles, proximal prolateral denticles situated in proximal quarter of finger, proximal retrolateral denticle situated midfinger; movable finger median denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six retrolateral denticles, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi retrolateral dorsal, retrolateral ventral and prolateral ventral spinule rows partial, restricted to distal half on legs I and II, vestigial, reduced to few distal spinules, or absent on III and IV (fig. 15D); retrolateral median row absent on I–IV; macrosetal counts on I–IV, respectively: dorsal, 2:2:2:2; retrolateral dorsal, 3:3:3:3; retrolateral ventral, 4:5:5:5; prolateral ventral, 3:3:4:4, proximal two macrosetae subspiniform on III, spiniform on IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long, with three pairs of macrosetae (fig. 8D); sclerites fused longitudinally; genital papillae absent.

Hemispermatophore: Unknown.

Pectines: Basal piece with three pairs of macrosetae and one posteromedian macroseta (fig. 8D). Marginal lamella comprising three sclerites. Medial lamella proximal two or three sclerites fused, five separate. Fulcra, 10. Pectinal teeth, 11. Pectines short, third (distal) sclerite of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte medially, shagreened laterally (fig. 22C), dorsal median carinae complete, costate, becoming granular posteriorly, dorsal lateral carinae obsolete; VII intercarinal surfaces shagreened, dorsal median carina partial, restricted to anterior half of segment, costate, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth (fig. 22D), spiracles minute, slitlike, twice as long as wide; V ventral surface without hyaline glandular area posteromedially; VII intercarinal surfaces smooth, with vestigial hyaline glandular area posteromedially, carinae obsolete except ventral lateral carinae incomplete, weakly granular posteromedially with two pairs of macrosetae, lateral ventral and ventral submedian carinae each with one pair of macrosetae.

Metasoma: Metasoma length 1.4 times greater than mesosoma length (table 2); segment I width 1.6 times greater than length; II width 1.3 times greater than length; III width 1.2 times greater than length; V width 1.3 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 10D, 11D); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, partial, restricted to anterior two-thirds, costate-granular on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior half, granular

on II and III, absent on IV and V; ventral lateral and ventral submedian carinae complete, granular on I–IV; ventral lateral and ventral median carinae complete, granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:0:0:1:4; lateral median carinae, 0:1:1:2:2; lateral inframedian carinae, 0:0:0:0:0; ventral lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:1.

Telson: Vesicle elongate; length 2.5 times greater than width, 2.3 times greater than aculeus length (table 2). Dorsal surface smooth. Ventral lateral intercarinal surfaces sparsely granular; carinae obsolete, each with three or four pairs of macrosetae; ventral median carina with four pairs of macrosetae; subaculear tubercle simple, spiniform with discontinuous granules proximally (fig. 14D). Aculeus laterobasal microserration comprising 3/3 spinules.

DISTRIBUTION: *Konetontli ilitchi*, sp. nov., is known only from the type locality in Colima, Mexico (fig. 1).

ECOLOGY: Although the three known specimens were collected inside a cave, they lack troglomorphies (Prendini, 2001; Volschenk and Prendini, 2008). The habitus, e.g., infuscate integument, relatively short appendages, and fully developed ocelli, suggests this species is epigean and the occurrence of two specimens inside a cave was incidental. The area surrounding the cave is tropical subdeciduous forest, 20–25 m high, comprising tree species, 50%–75% of which are perennial (Rzedowski, 1978). The habitat and habitus of *K. ilitchi*, sp. nov., are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Colima:** *Municipio de Coquimatlán*: Coquimatlán, 8 km S, 19°09.061′N 103° 50.080′W, 277 m, 2007–2008, H. Montaño, A. Valdez, O.F. Francke, and N. Perez, 1 ♀ (AMNH [LP 8583]), inside a cave.

Konetontli juxtlahuaca, sp. nov.
Figures 2, 6A, 8B, 10E, 11E, 14E, 15E, 16G, H, 17G, 25, 26; tables 1, 3, 4

TYPE MATERIAL: **MEXICO: Guerrero:** *Municipio de Quechultenango*: Holotype ♂ (CNAN T0889), Gruta de Juxtlahuaca, entrance [17°25′30.77″N 99°06′36.02″W], 2.v.2009, A. Valdez and H. Montaño, tropical dry forest. Paratypes: 1 ♂, 4 juv. (CNAN T0888), Colotlipa, 5 km NW [17°24.527′N 99°09.972′W], 19.vii.2005, A. Valdez and H. Montaño, tropical dry forest; 9 ♀, 1 juv. (CNAN T0892), Colotlipa, near Grutas de Juxtlahuaca, 14.ix.2005, A. Valdez and H. Montaño, tropical dry forest; 1 ♂, 2 ♀ (AMNH), 1 ♂, 1 ♀ (CNAN T0890), Grutas de Juxtlahuaca, 17°26.350′N 99°09.567′W, 936 m, 3.xi.2007, O.F. Francke, H. Montaño, J.A. Ballesteros, A. Valdez, and H. Montaño, tropical dry forest.

ETYMOLOGY: The species name *juxtlahuaca* is a noun in apposition, taken from the Nahuatl name for the cave where some of the material was collected, and means "there is no dry soil."

DIAGNOSIS: *Konetontli juxtlahuaca*, sp. nov., is closely related to *K. acapulco*, *K. ignes*, sp. nov., *K. kuarapu*, and *K. zihuatanejensis*, comb. nov., with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of obsolete or weakly granular ventral submedian carinae on metasomal segments I–IV, and 14 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli juxtlahuaca*, sp. nov., is the sister species of *K. ignes*, sp. nov., with which it shares vestigial lateral median carinae and obsolete ventral lateral carinae on metasomal segments III and IV, and a slender pedipalp chela manus, narrower than the patella. The two species differ in the following respects. The pedipalp femur dorsal prolateral carina is granular and markedly infuscate in *K. juxtlahuaca*, sp. nov., but obsolete, smooth, and infuscate distally in *K. ignes*, sp. nov. The pedipalp patella carinae and dorsal and retrolateral surfaces are markedly infuscate in *K. juxtlahuaca*, sp. nov., but almost immaculate in *K. ignes*, sp. nov. The pedipalp chela manus is almost immaculate except distally, and the fingers infuscate in *K. juxtlahuaca*, sp. nov., whereas the pedipalp chela carinae and intercarinal surfaces are markedly infuscate in *K. ignes*, sp. nov. The median denticle row of the pedipalp chela fixed finger possesses six denticle subrows with six retrolateral

TABLE 3

Measurements (mm) of Hemispermatophores of *Konetontli acapulco* (Armas and Martín-Frías, 2001), *Konetontli chamelaensis* (Williams, 1986), *Konetontli ignes*, sp. nov., *Konetontli ilitchi*, sp. nov., *Konetontli juxtlahuaca*, sp. nov., *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), *Konetontli migrus*, sp. nov., *Konetontli nayarit* (Armas and Martín-Frías, 2001), *Konetontli pattersoni* (Williams and Haradon, 1980), and *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., Deposited at the American Museum of Natural History, New York (AMNH), and the Colección Nacional de Arácnidos, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (CNAN)

	Coll.	Lamina length	Trunk length	Distal barb length	Basal plate length	Dorsal trough–laminar hooks	Ventral trough–laminar hooks
K. acapulco	CNAN	2.79	1.36	0.17	0.34	1.12	0.68
K. chamelaensis	CNAN	1.7	0.68	0.1	0.24	0.71	0.51
K. ignes	AMNH	1.36	0.85	0.07	0.24	0.51	0.34
K. juxtlahuaca	CNAN	1.87	1.02	0.1	0.24	0.78	0.44
K. kuarapu	CNAN	2.21	1.02	0.1	0.34	1.05	0.68
K. migrus	AMNH	1.7	0.85	0.07	0.2	0.75	0.51
K. nayarit	CNAN	2.38	1.12	0.17	0.48	1.16	0.75
K. pattersoni	AMNH	2.89	1.19	0.2	0.51	1.16	0.68
K. zihuatanejensis	CNAN	2.38	1.19	0.2	0.51	1.96	0.92

denticles in *K. juxtlahuaca*, sp. nov., but five of each in *K. ignes*, sp. nov.

Konetontli juxtlahuaca, sp. nov., differs further from *K. ignes*, sp. nov., and the other three species as follows. The telson subacular tubercle is simple or compound in *K. juxtlahuaca*, sp. nov., but simple in *K. acapulco* and *K. ignes*, sp. nov. The compound tubercle observed in some specimens of *K. juxtlahuaca*, sp. nov., comprises only a single secondary tubercle in addition to the primary tubercle whereas the compound tubercle of *K. kuarapu* comprises a primary tubercle preceded by four secondary tubercles, the first two forming a bicuspid, preceded by a row of granules along the ventral median carina of the telson. The pedipalp chela is slender and the chela fingers infuscate in *K. juxtlahuaca*, sp. nov., whereas the chela is incrassate and immaculate in *K. kuarapu*. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. juxtlahuaca*, sp. nov., but five of each in *K. ignes*, sp. nov., and seven of each in *K. acapulco* and *K. zihuatanejensis*, comb. nov.

DESCRIPTION: The following description is based on the type material and additional material examined.

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate. Carapace base color yellowish orange, entirely infuscate. Pedipalps base color yellowish, paler than carapace, mesosoma, and metasoma; femur dorsal intercarinal surface infuscate except proximally, retrolateral intercarinal surface immaculate, retrolateral dorsosubmedian carina infuscate, dorsal and prolateral surfaces faintly infuscate; patella dorsal and retrolateral intercarinal surfaces infuscate, ventral and prolateral intercarinal surfaces more faintly infuscate; retrolateral dorsal, retrolateral median, and retrolateral ventral carinae infuscate, prolateral ventral carina faintly infuscate, prolateral median carina infuscate, more faintly in proximal than distal half; chela manus immaculate, fixed and movable fingers infuscate in proximal half, fingertips immaculate. Legs base color yellowish, paler than carapace, mesosoma and metasoma retrolateral surfaces infuscate. Coxosternal region and genital operculum immaculate, pectines faintly infuscate. Mesosoma base color yellowish orange, entirely infuscate; tergites I–VII dorsal median carinae immaculate, dorsal lateral carinae infuscate, dorsal submedian and dorsal lateral intercarinal surfaces mostly immaculate; sternites III–VII submedian and lateral surfaces diffusely infuscate, lateral surfaces more densely so on VII. Metasoma base color yellowish orange to reddish brown, becoming progressively darker posteriorly; all surfaces diffusely infuscate; dorsal and lateral carinae infuscate, ventral submedian and ventral lateral carinae infuscate on segments

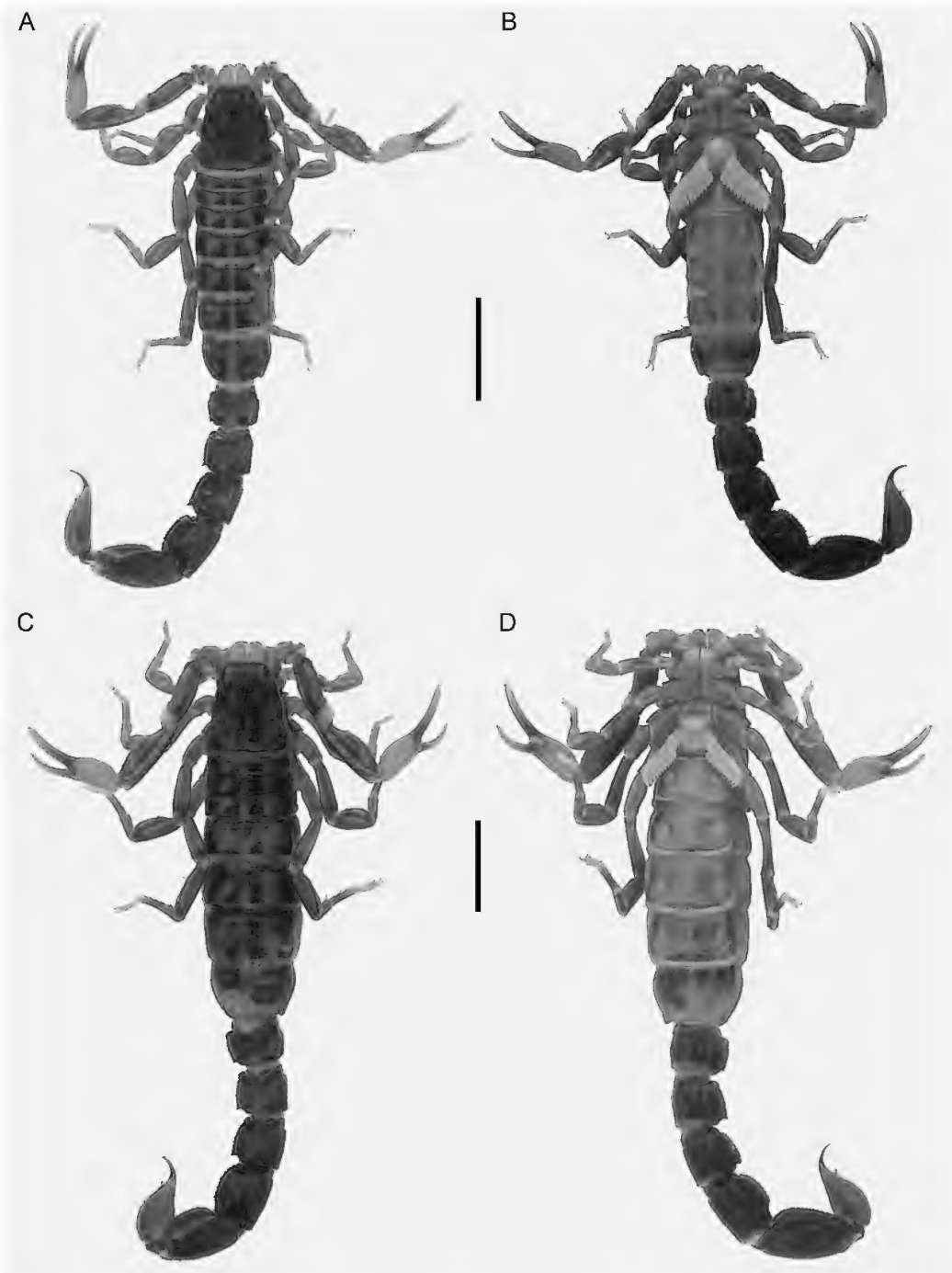

Fig. 25. *Konetontli juxtlahuaca*, n. sp., habitus. **A**, **B**. Holotype ♂ (CNAN T0889). **C**, **D**. Paratype ♀ (CNAN T0892). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 2.5 mm.

I–IV, bands of infuscation converging posteriorly; ventral median carina infuscate in anterior quarter on V. Telson vesicle base color yellowish orange, paler than metasomal segment V; aculeus dark reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 12 tines, in distal half.

Carapace: Length 1.1 times greater than posterior width (table 4). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 6A). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace; superciliary carinae weakly developed, smooth. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian and posterolateral sulci moderately developed; posteromedian sulcus shallow anteriorly, becoming deeper posteriorly; anterolateral and posterior transverse sulci obsolete. Surfaces matte, uniformly finely granular.

Coxosternal region: Sternum subequilateral pentagonal; 1.7 times wider than long (table 4); median sulcus deep; ventral surfaces finely granular; with four pairs of macrosetae (fig. 8B). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa II proximal margin entirely finely granular, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with deep depression, medial margin smooth. Coxa IV length 1.93 times greater than coxa II length (table 4).

Pedipalps: Femur intercarinal surfaces matte (fig. 26A); dorsal prolateral and dorsal retrolateral carinae granular; retrolateral dorsosubmedian carina obsolete, demarcated by three macrosetae medially; retrolateral ventral and ventral median carinae obsolete, smooth; ventral prolateral carina complete, granular; prolateral ventral carina obsolete, demarcated by three macrosetae; prolateral ventrosubmedian carina partial, restricted to proximal three-quarters of segment and reduced to spiniform granule distally and one macroseta subproximally. Patella width equal to femur width (table 4); intercarinal surfaces smooth (fig. 26B–E); dorsal prolateral, dorsal retrolateral, ventral prolateral, and ventral retrosubmedian finely and sparsely granular; ventral median carina obsolete, smooth; retrolateral dorsal, retrolateral median, retrolateral ventral and prolateral ventral carinae obsolete, prolateral ventral carina demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.3 times greater than patella length, 1.7 times greater than femur length (table 4); width 0.8 times greater than patella width and femur width. Manus slender (fig. 26 F–I); intercarinal surfaces smooth; prolateral dorsal, dorsal median, dorsal retrolateral, retrolateral median, ventral submedian, ventral prosubmedian, prolateral ventral, and prolateral median carinae obsolete, smooth. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising six denticle subrows flanked by five prolateral denticles and six retrolateral denticles, proximal prolateral denticles situated in distal half of finger, proximal retrolateral denticle situated in proximal quarter; movable finger median denticle row comprising six denticle subrows, flanked by six prolateral and retrolateral denticles. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi retrolateral dorsal, retrolateral ventral, and prolateral ventral spinule rows partial, restricted to distal half on legs I and II, absent on III and IV (fig. 15E); retrolateral median row absent on I–IV; macrosetal counts on I–IV, respectively: dorsal and retrolateral dorsal, 2:2:2:2; retrolateral ventral, 3:4:5:5; prolateral ventral, 4:4:4:4, proximal two macrosetae subspiniform on III, spiniform on IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on

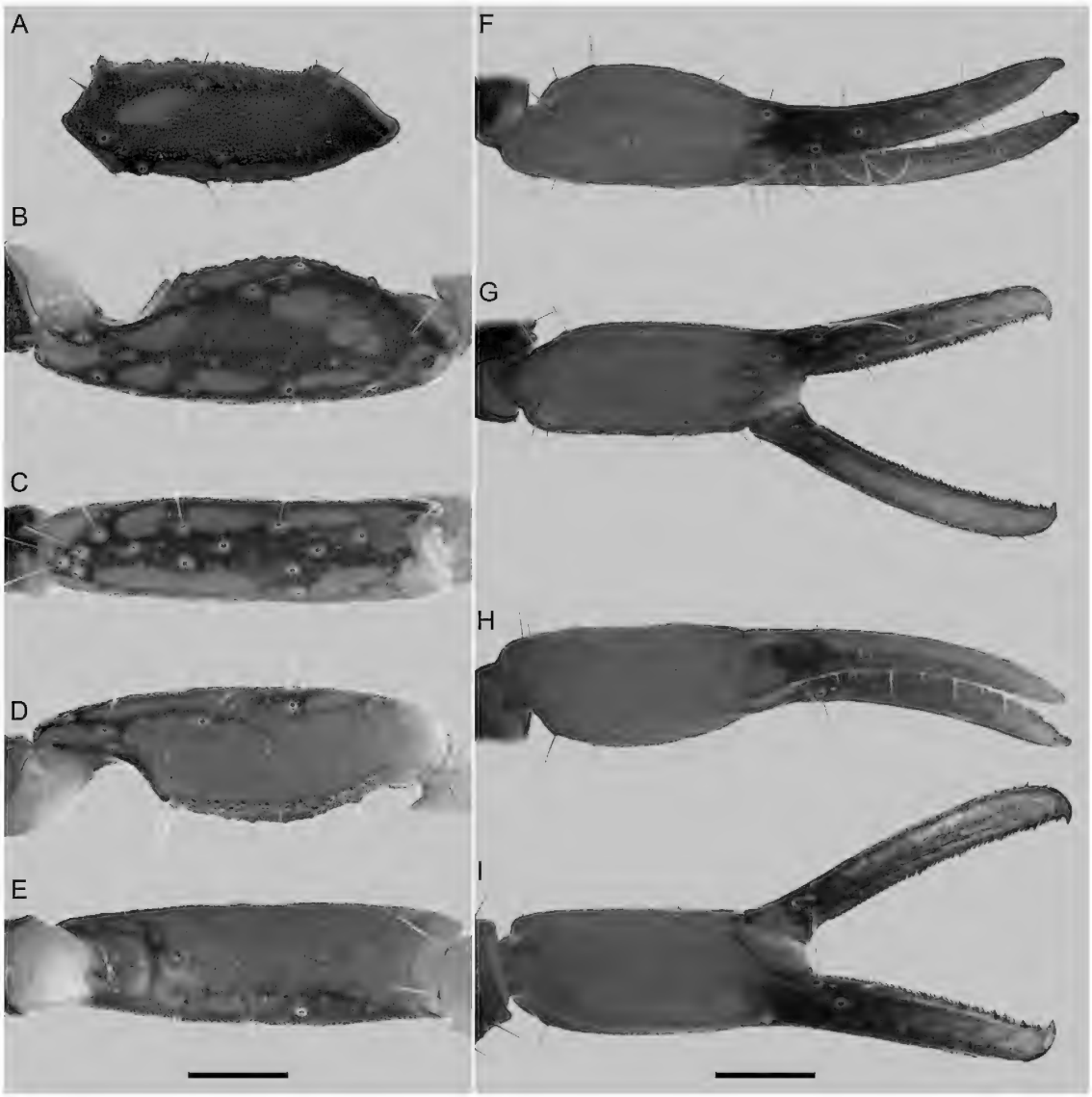

Fig. 26. *Konetontli juxtlahuaca*, n. sp., holotype ♂ (CNAN T0889), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and with one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 8B), with four (♂) or three (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 1.83 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16G). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (figs. 16H, 17G). Hemimating plug developed from

inner lobe, distal barb margin with approximately 12 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.43 times basal plate length (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 8B). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, eight sclerites separate. Fulcra, 10–11 (♂), 9–10 (♀). Pectinal teeth, 11–12 (♂), 10–11 (♀). Pectines relatively short, midpoint (♂) or distal margin (♀) of third (distal) sclerite of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte (fig. 25A, C), dorsal median carinae complete, costate, dorsal lateral carinae obsolete; VII intercarinal surfaces shagreened, dorsal median carina complete, granular in anterior half of segment, becoming costate in posterior half, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth medially, finely granular laterally (fig. 25B, D), spiracles minute, slitlike, approximately three times longer than wide; V ventral surface without hyaline glandular area posteromedially; VII intercarinal surfaces smooth, with moderately developed hyaline glandular area posteromedially, finely granular laterally, carinae obsolete, lateral ventral and ventral submedian carinae each with one pair of macrosetae, ventral lateral carinae each with two pairs of macrosetae.

Metasoma: Metasoma length 1.4 times greater than mesosoma length; segment I width 1.9 times greater than length; II width 1.3 times greater than length; III width 1.2 times greater than length; V width 1.7 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 10E, 11E); dorsal lateral carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–IV, partial, restricted to anterior half of segment, granular on V; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, vestigial, reduced to anterior granule on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior third, granular on II, partial, restricted to posterior fifth, granular on III, absent on IV and V; ventral lateral and ventral submedian carinae obsolete on I–IV; ventral lateral, ventral sublateral, and ventral median carinae obsolete on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:0:1:1:5; lateral median carinae, 1:1:1:2:5; lateral inframedian carinae, 2:2:2:2:0; ventral lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:3; ventral submedian carinae, 2:3:3:3:3.

Telson: Vesicle globose; length 2.1 times greater than width, twice aculeus length (table 4). Dorsal surface smooth. Ventral surface carinae obsolete, smooth, each with five pairs of macrosetae; ventral median carina with four pairs of macrosetae, subaculear tubercle simple, conical, blunt. Aculeus laterobasal microserration comprising three spinules (fig. 14E).

DISTRIBUTION: *Konetontli juxtlahuaca*, sp. nov., is known from only four localities in Guerrero, Mexico (fig. 2).

ECOLOGY: The known localities of this species occur on the western slope of the Sierra Madre del Sur, in an area dominated by tropical deciduous forest. As with *K. ilitchi*, sp. nov., some specimens were collected inside a cave. However, *K. juxtlahuaca*, sp. nov., lacks troglomorphies (Prendini, 2001; Volschenk and Prendini, 2008) and some specimens were taken on the surface, outside the cave. The habitat and habitus of *K. juxtlahuaca*, sp. nov., are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001), suggesting the occurrence of specimens inside a cave was incidental.

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Guerrero:** *Municipio de Quechultenango*: Grutas de Juxtlahuaca, 17°26.350′N 99°09.567′W, 936 m, 3.xi.2007, O.F. Francke, H. Montaño, J.A. Ballesteros, A. Valdez, and H. Montaño, 1 ♀ (AMNH [LP 8585]), tropical dry forest.

Konetontli kuarapu (Francke and Ponce-Saavedra, 2005)
Figures 3, 6B, 9C, 12A, 13A, 14F, 15F, 16I, J, 27, 28; tables 1, 3, 4

Vaejovis kuarapu Francke and Ponce-Saavedra, 2005: 64–68, figs. 1–7, 9, 14, 15; Graham and Fet, 2006: 9; Soleglad and Fet, 2008: 31, 73, 74, 89, 100.

Konetontli kuarapu (Francke and Ponce-Saavedra, 2005): González-Santillán and Prendini, 2013: 35, 36.

TYPE MATERIAL: **MEXICO: Michoacán:** *Municipio de Parácuaro*: Holotype ♂ (CNAN T0188), paratype ♂ (AMNH), paratype ♀ (UMSNH), La Batea [ca. 10 km E of Parácuaro], 19°07′54″N 102°07′48″W, 360 m, 21.x.2000, J. Ponce et al., under rocks.

DIAGNOSIS: *Konetontli kuarapu* is closely related to *K. acapulco*, *K. ignes*, sp. nov., *K. juxtlahuaca*, sp. nov., and *K. zihuatanejensis*, comb. nov., with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of obsolete ventral submedian carinae on metasomal segments I–IV, and 14 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli kuarapu* differs from the other four species in the following respects. The telson subaculear tubercle is compound in *K. kuarapu* but simple in *K. acapulco* and *K. ignes*, sp. nov. The compound subaculear tubercle of *K. kuarapu* comprises a primary tubercle preceded by four secondary tubercles, the first two forming a bicuspid, preceded by a row of granules along the ventral median carina of the telson, whereas the compound subaculear tubercle of *K. zihuatanejensis*, comb. nov., and some specimens of *K. juxtlahuaca*, sp. nov., comprises only a single secondary tubercle in addition to the primary tubercle. The pedipalp chela is incrassate and immaculate in *K. kuarapu* but slender in *K. ignes*, sp. nov., and *K. juxtlahuaca*, sp. nov., the chela carinae and intercarinal surfaces markedly infuscate in *K. ignes*, sp. nov., and the chela fingers infuscate in *K. juxtlahuaca*, sp. nov. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. kuarapu*, but seven of each in *K. acapulco* and *K. zihuatanejensis*, comb. nov., and five of each in *K. ignes*, sp. nov.

DESCRIPTION: The following redescription, which is based on the type material and additional material examined, supplements the original description by Francke and Ponce-Saavedra (2005).

Color and infuscation: Cheliceral manus dorsal surface infuscate prolaterally and distally, fixed finger infuscate, movable finger infuscate proximally. Carapace base color yellow, entirely infuscate. Pedipalps base color yellow; femur and patella dorsal and retrolateral carinae infuscate; chela manus carinae and intercarinal surfaces immaculate, fingers infuscate proximally. Legs base color yellow, retrolateral surfaces infuscate. Coxosternal region, genital operculum, and pectines immaculate. Mesosoma base color yellowish orange, entirely infuscate; tergites I–VII dorsal median carinae immaculate except V–VII diffusely infuscate, dorsal lateral carinae infuscate; sternites III–VI ventral surfaces immaculate, except lateral margins infuscate; VII lateral ventral, ventral lateral, and ventral submedian carinae infuscate around bases of macrosetae. Metasoma base color orange to reddish brown, becoming darker posteriorly, segments IV and V darker than I–III; dorsal submedian, lateral median, and lateral inframedian carinae infuscate around bases of macrosetae; ventral lateral and ventral submedian carinae infuscate on I–IV; ventral median carina immaculate, ventral submedian carinae and posterior half of ventral lateral and ventral submedian intercarinal surfaces infuscate on V. Telson vesicle base color yellowish orange, paler than metasomal segment V; aculeus dark reddish brown.

Chelicerae: Manus dorsal surface smooth, with one macroseta subdistally. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 19 tines, in distal half.

Carapace: Length 1.2 times greater than posterior width (table 4). Anterior margin moderately bilobate with vestigial median notch and three pairs of macrosetae (fig. 6B). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle slightly raised, situated in anterior third of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus shallow; posteromedian sulcus shallow anteriorly, becoming deeper posteriorly; posterolateral sulci shallow; anterolateral and posterior transverse sulci obsolete. Surfaces shagreened, uniformly finely granular with scattered coarse granules.

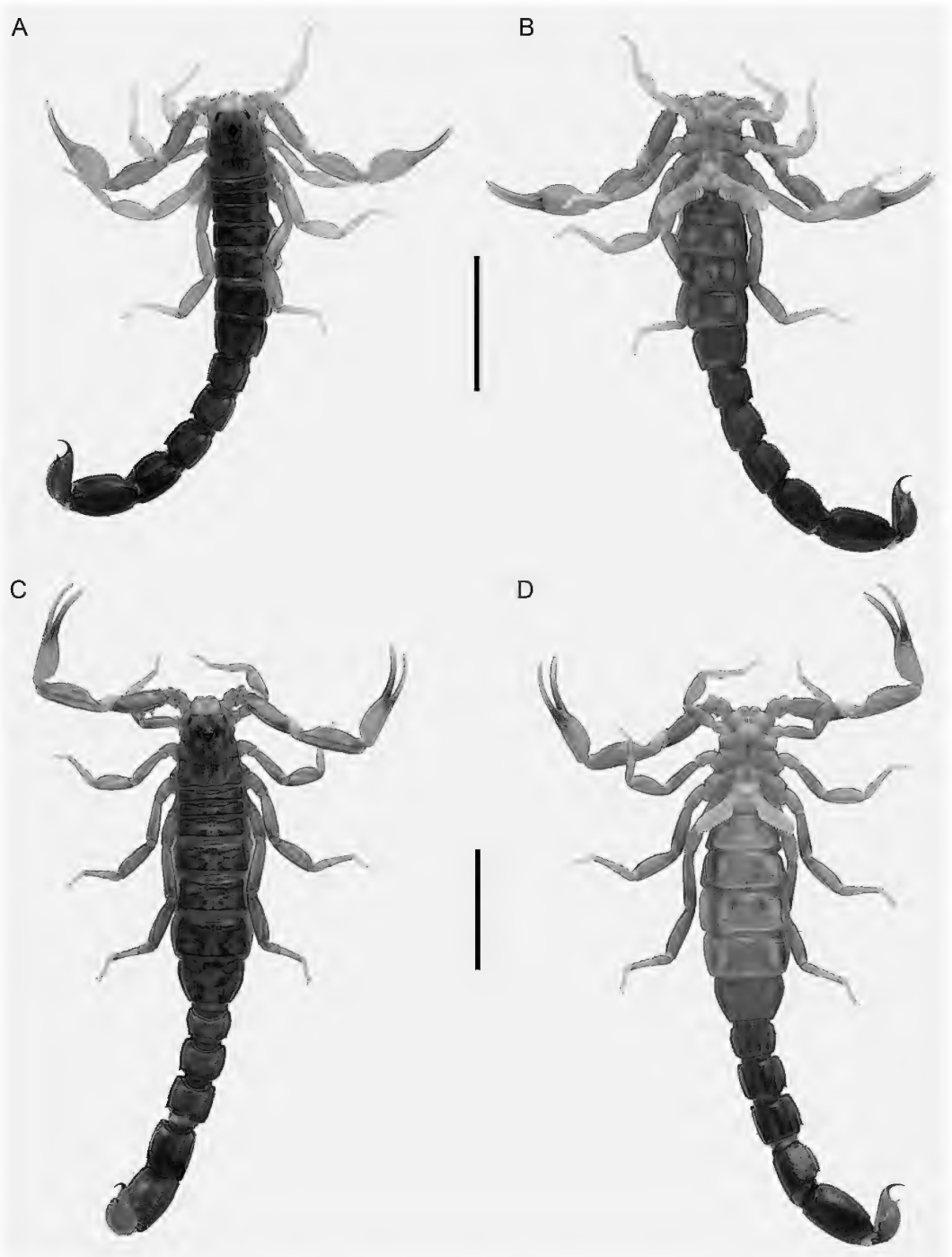

Fig. 27. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), habitus. **A**, **B**. Paratype ♂ (AMNH). **C**, **D**. ♀ (UMSNH). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 5 mm.

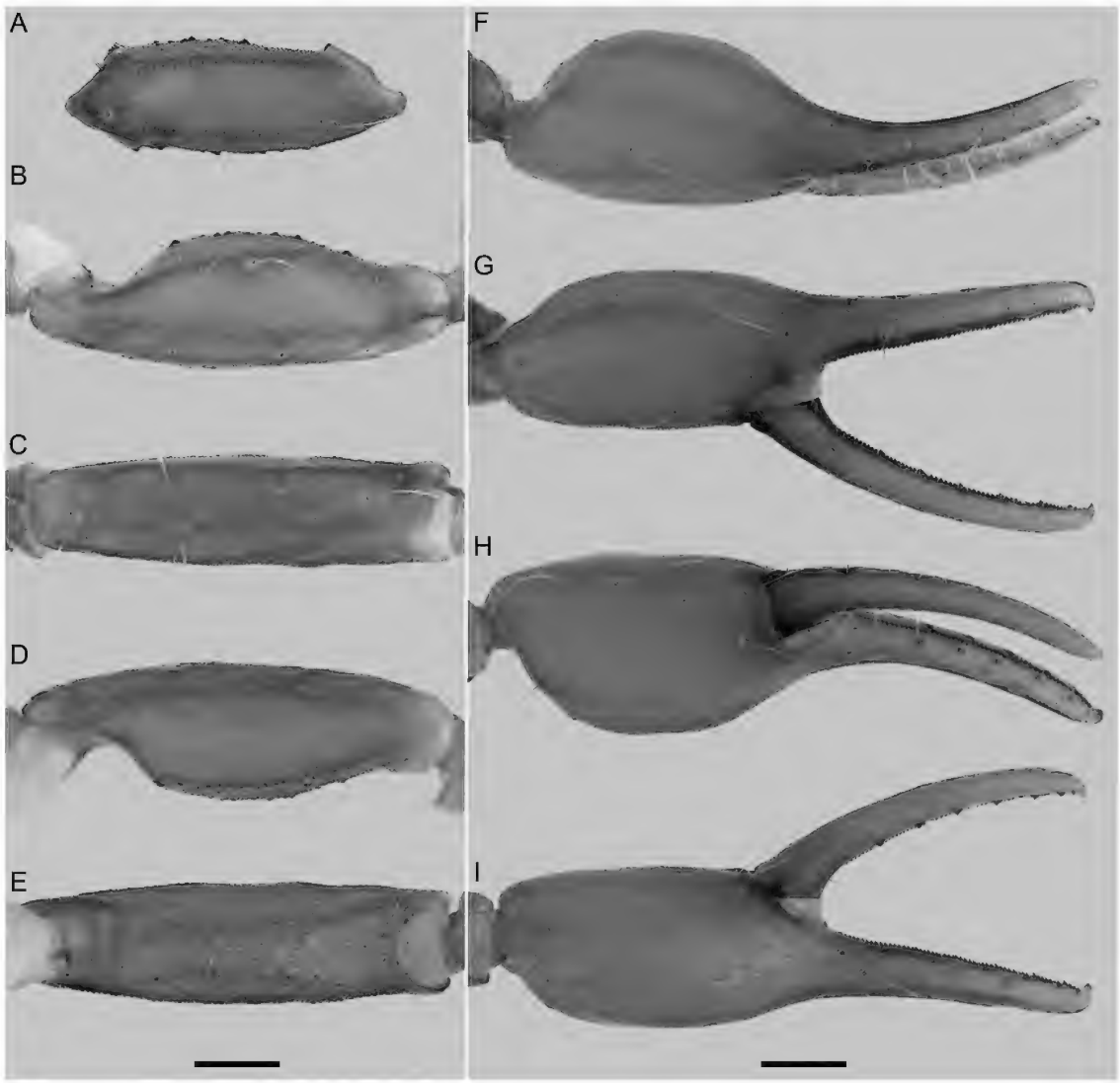

Fig. 28. *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), paratype ♂ (AMNH), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

Coxosternal region: Sternum subequilateral pentagonal; 1.2 times wider than long (table 4); median sulcus deep; ventral surfaces matte; with three pairs of macrosetae (fig. 9C). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa IV proximal margin entirely finely granular, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with shallow depression, medial margin finely granular. Coxa IV length 1.88 times greater than coxa II length (table 4).

Pedipalps: Femur intercarinal surfaces matte (fig. 28A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae granular; retrolateral dorsosubmedian carina obsolete, demarcated by two macrosetae medially; retrolateral ventral and ventral median carinae vestigial, reduced to few granules proximally; prolateral ventral carina partial, reduced to spiniform granule with

one macroseta proximally and three large spiniform granules with two macrosetae medially; prolateral ventrosubmedian carina partial, reduced to large spiniform granule proximally, adjacent to trichobothrium *i*, and three or four smaller granules medially. Patella width 1.1 times greater than femur width (table 4); intercarinal surfaces matte (fig. 28B–E); dorsal prolateral carina granular; dorsal retrolateral and ventral retrolateral carinae obsolete; ventral retrosubmedian carina partial, granular proximally, becoming smooth distally; ventral prolateral carina complete, granular; ventral median carina partial, granular in proximal third; prolateral ventral carina demarcated by two spiniform granules with macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela, length 1.5 times greater than patella length, 1.7 times greater than femur length (table 4); width 1.5 times greater patella width, 1.6 times greater than femur width. Manus incrassate (fig. 28F–I); surfaces smooth, acarinate. Fixed and movable fingers dentate margin sublinear, notches and lobes absent, moderate gap evident proximally when fingers closed; fixed finger median denticle row comprising six denticle subrows flanked by six prolateral and retrolateral denticles; movable finger median denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six retrolateral denticles, proximal retrolateral denticle situated midfinger. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth prolateral denticle and macroseta associated with seventh prolateral denticle (absent).

Legs: Basitarsi retrolateral dorsal and retrolateral ventral spinule rows partial, restricted to distal third on legs I and II, retrolateral dorsal row absent, retrolateral ventral row partial, restricted to distal quarter on III (fig. 15F), retrolateral dorsal and retrolateral ventral rows absent on IV, retrolateral median and prolateral ventral rows absent on I–IV; macrosetal counts on I–IV, respectively: dorsal, 2:2:2:2; retrolateral dorsal, 3:3:3:3; retrolateral ventral, 3:4:5:6; prolateral ventral, 4:4:4:4, proximal three macrosetae spiniform on II–IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 9C), with two (♂) or three (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 2.17 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16I). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 16J). Dorsal trough margin long, narrow, curving proximally, removed from ventral trough. Hemimating plug developed from inner lobe, distal barb margin with approximately 12 short spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.3 times basal plate length (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 9C). Marginal lamella comprising three sclerites. Medial lamella with proximal sclerites fused, seven sclerites separate. Fulcra, 11–12 (♂), 11 (♀). Pectinal teeth, 12–13 (♂), 12 (♀). Pectines relatively long, second (medial) sclerite (♂) or midpoint of third (distal) sclerite (♀) of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VII intercarinal surfaces matte (fig. 27A, C); I–VI dorsal median carinae absent on I and II, partial, restricted to posterior half of segment, costate to costate granular, on III−VI, dorsal lateral carinae absent; VII dorsal median carina partial, restricted to anterior half of segment, costate, dorsal lateral and lateral median

carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces finely granular (fig. 27B, D), spiracles minute, suboval; V ventral surface with moderately developed hyaline glandular area posteromedially; VII intercarinal surfaces finely granular, without hyaline glandular area posteromedially, carinae obsolete, ventral lateral carinae each with two pairs of macrosetae, ventral submedian carinae each with three pairs of macrosetae.

Metasoma: Metasoma length 1.5 times greater than mesosoma length; segment I width 1.5 times greater than length; II width 1.2 times greater than length; III width 1.1 times greater than length; V width 1.6 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 12A, 13A); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, vestigial, reduced to anterior granule on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior third, granular on II and III, absent on IV and V; ventral lateral carinae complete, costate-granular on I−IV, complete, granular in proximal third, granules becoming more pronounced posteriorly on V; ventral submedian carinae obsolete, indicated only by macrosetae on I−IV; ventral median carina obsolete on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 1:1:1:1:3; lateral median carinae, 0:2:2:3:1; lateral inframedian carinae, 1:1:1:2:0; ventral lateral carinae, 2:3:3:3:4; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:2.

Telson: Vesicle globose; length 2.2 times greater than width, 2.4 times aculeus length (table 4). Dorsal surface smooth. Ventral lateral surfaces sparsely granular; ventral sublateral carinae shallowly costate-granular, each with three pairs of macrosetae and four or five pairs of microsetae; ventral median carina with six pairs of macrosetae; subaculear tubercle compound, primary tubercle enlarged, blunt, triangular preceded by two or three serrate granules, and smaller, blunt spiniform secondary tubercle anteriorly. Aculeus laterobasal microserration comprising 4–5 spinules (fig. 14F).

DISTRIBUTION: *Konetontli kuarapu* is restricted to the Balsas Depression in Michoacán, Mexico, and known from only six specimens collected at the type locality and a second locality ca. 10 km west thereof (fig. 3). The locality data on label of the paratype deposited at the AMNH and one paratype deposited at CNAN differ from the data reported in the original description: El Valle was omitted and only the type locality, La Batea, reported.

ECOLOGY: According to Francke and Ponce-Saavedra (2005), the specimens were collected by turning rocks in an area of secondary thorn forest, and tropical deciduous forest at 360 m altitude. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

REMARKS: Francke and Ponce-Saavedra (2005) described this species in the genus *Vaejovis*. It was transferred to *Konetontli* by González-Santillán and Prendini (2013).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Michoacán:** *Municipio de Parácuaro*: El Valle [ca. 5 km S of Parácuaro; 19°06′12.41″N 102°13′09.73″W], 21.x.2000, J. Ponce et al., 1 ♂ (AMNH), 1 ♀ (UMSNH).

Konetontli migrus, sp. nov.
Figures 3, 6C, 9B, 12B, 13B, 14G, 16K, L, 29, 30; tables 1, 3, 4

TYPE MATERIAL: **MEXICO: Guerrero:** *Municipio de Coyuca de Catalan*: Holotype ♂ (CNAN T0891 [ARA 2077]), paratype ♂ (AMNH [ARA 3814]), Puente El Cedral II [ca. 68 km NE of Zihuatanejo on Mexico Route 134], 18°02.405′N 101°04.382′W, 796 m, 2.iv.2008, O.F. Francke, H. Montaño, J. Ponce, and A. Quijano.

ETYMOLOGY: The species name *migrus* is a noun in apposition, taken from the medieval Latin word for "small," and refers to the small size of this species.

DIAGNOSIS: *Konetontli migrus*, sp. nov., is closely related to *K. chamelaensis*, *K. ilitchi*, sp. nov., *K. nayarit*, and *K. pattersoni* with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of granular ventral submedian

TABLE 4

Measurements (mm) of *Konetontli juxtlahuaca*, sp. nov., *Konetontli kuarapu* (Francke and Ponce-Saavedra, 2005), *Konetontli migrus*, sp. nov., and *Konetontli nayarit* (Armas and Martín-Frías, 2001), Deposited at the American Museum of Natural History, New York (AMNH), the Colección Nacional de Arácnidos, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (CNAN), and the Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Mexico (UMSNH)

Species		*K. juxtlahuaca*						*K. kuarapu*		*K. migrus*		*K. nayarit*	
Collection		CNAN	AMNH	CNAN				CNAN	UMSNH	CNAN	AMNH	CNAN	CNAN
Number		T0889		T0892				T0188		T0891		T0177	SC3852
Type		Holo.	Para.	Para.	Para.	Para.	Para.	Holo.	Para.	Holo.	Para.	Holo.	
Sex		♂	♂	♀	♀	♀	♀	♂	♀	♂	♂	♂	♀
Carapace	length	2.0	1.95	2.5	2.5	2.5	2.5	2.6	2.25	2.0	1.98	2.75	2.65
	ant. width	1.1	1.1	1.35	1.35	1.35	1.35	1.3	1.3	1.05	1.00	1.45	1.4
	post. width	1.9	1.85	2.35	2.3	2.45	2.45	2.25	2.25	1.83	1.78	2.6	2.6
Femur	length	1.5	1.45	2.0	1.9	1.95	1.95	2.15	2.0	1.5	1.38	2.0	1.9
	width	0.6	0.5	0.75	0.6	0.7	0.7	0.75	0.65	0.55	0.55	0.75	0.75
Patella	length	1.9	1.7	2.35	2.25	2.35	2.25	2.5	2.5	1.8	1.68	2.35	2.3
	width	0.6	0.65	0.85	0.75	0.85	0.8	0.85	0.75	0.6	0.63	1.0	0.95
Chela	length	2.5	2.45	3.3	3.2	3.35	3.15	3.6	3.5	2.75	2.75	3.65	3.35
Manus	width	0.5	0.6	0.75	0.75	0.8	0.75	1.15	0.65	0.85	0.83	1.15	0.95
Manus	height	0.5	0.55	0.75	0.7	0.75	0.75	0.9	0.75	0.8	0.75	1.35	0.9
Fixed finger	length	1.3	1.2	1.55	1.5	1.5	1.55	1.75	1.75	1.25	1.23	1.65	1.55
Mov. finger	length	1.6	1.5	2.0	1.95	1.95	1.95	2.2	2.25	1.6	1.55	2.25	1.95
Coxa II	length	0.85	0.85	1.0	1.0	1.05	1.0	1.0	1.0	0.73	3.68	1.1	1.05
Coxa IV	length	1.6	1.5	2.0	2.05	2.0	2.1	2.0	2.0	1.5	0.80	2.2	2.2
Sternum	length	0.4	0.35	0.6	0.5	0.5	0.5	0.5	0.6	0.55	1.38	0.5	0.75
	width	0.6	0.6	0.75	0.75	0.7	0.75	0.75	0.95	0.43	0.43	0.95	0.6
Mesosoma	length	4.3	4.0	5.95	5.1	5.1	5.25	5.3	5.85	4.2	0.55	5.8	6.2
Metasoma	length	6.2	6.4	7.7	7.15	7.8	7.25	8.45	7.5	6.6	6.53	9.7	8.0
Segment I	length	0.7	0.75	0.9	0.85	0.95	0.85	1.15	0.95	0.8	0.75	1.15	0.95
	width	1.3	1.3	1.65	1.65	1.65	1.65	1.65	1.5	1.25	1.23	1.75	1.7
	height	1.0	1.15	1.3	1.2	1.3	1.3	1.3	1.0	1.1	0.75	1.35	1.4
Segment II	length	0.09	0.95	1.1	1.0	1.15	1.0	1.3	1.1	1.0	0.88	1.5	1.15
	width	1.2	1.25	1.65	1.55	1.65	1.6	1.65	1.55	1.25	1.20	1.75	1.65
	height	1.0	1.1	1.25	1.2	1.25	1.2	1.25	1.0	1.0	0.88	1.45	1.4
Segment III	length	1.0	1.0	1.2	1.05	1.1	1.05	1.45	1.25	1.1	1.03	1.6	1.25
	width	1.2	1.25	1.6	1.55	1.65	1.6	1.7	1.55	1.2	1.23	1.75	1.65
	height	1.0	1.05	1.2	1.25	1.3	1.2	1.25	1.0	1.0	0.90	1.45	1.35
Segment IV	length	1.6	1.45	1.8	1.65	1.85	1.75	2.0	1.8	1.6	1.60	2.25	1.9
	width	1.2	1.25	1.65	1.55	1.65	1.6	1.65	1.55	1.15	1.23	1.75	1.6
	height	1.0	1.05	1.3	1.25	1.25	1.25	1.25	1.0	1.0	1.00	1.45	1.4
Segment V	length	2.0	2.25	2.7	2.6	2.75	2.6	2.55	2.4	2.1	2.28	3.2	2.75
	width	1.2	1.3	1.7	1.5	1.7	1.65	1.85	1.55	1.2	1.25	1.75	1.8
	height	1.0	1.05	1.3	1.25	1.45	1.25	1.3	1.0	1.1	1.00	1.7	1.45
Telson	length	2.1	2.15	2.5	2.45	2.4	2.35	2.4	2.25	2.0	2.08	2.6	2.55
Vesicle	length	1.4	1.45	1.75	1.65	1.4	1.65	1.65	1.5	1.25	1.38	1.85	1.85
	width	1.0	0.95	1.15	1.05	1.2	1.1	1.15	1.1	0.95	0.73	1.15	1.3
	height	0.7	0.75	0.85	0.8	0.95	0.9	1.0	0.75	0.65	0.65	0.8	0.95
Aculeus	length	0.7	0.7	0.75	0.8	1.0	0.7	0.75	0.75	0.75	0.70	0.75	0.7
Total	length	14.6	14.5	18.65	17.2	17.8	17.35	18.75	17.85	14.8	14.25	20.85	19.4

carinae on metasomal segments I–IV; and 11 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli migrus*, sp. nov., differs from the other four species in the following respects. The pedipalp femur prolateral dorsal and dorsal retrolateral carinae are granular in *K. migrus*, sp. nov., but obsolete in *K. chamelaensis*. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. migrus*, sp. nov., but five of each in *K. chamelaensis*. The pedipalp chela is incrassate in *K. migrus*, sp. nov., but slender in *K. chamelaensis* and *K. ilitchi*, sp. nov. The chela manus is almost immaculate, the fingers faintly and diffusely infuscate in *K. migrus*, sp. nov., whereas the manus intercarinal surfaces are diffusely infuscate, the carinae and fingers markedly infuscate, in *K. ilitchi*, sp. nov., and the manus markedly infuscate distally, with the fingers markedly infuscate in *K. pattersoni*. *Konetontli migrus*, sp. nov., is smaller, with total length ca. 14–15 mm, than *K. nayarit* and *K. pattersoni*, with total lengths ca. 19–25 mm. The ventral submedian carinae of metasomal segments II and III are obsolete in *K. migrus*, sp. nov., but granular in *K. nayarit*. The ventral median carina of the telson vesicle is complete in *K. migrus*, sp. nov., but restricted to the posterior third in *K. nayarit*. The telson is globose with the ventral surface granular in *K. migrus*, sp. nov., but elongate, with the ventral surface smooth in *K. pattersoni*.

DESCRIPTION: The following description is based on the holotype and paratype. The female of this species is unknown.

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate proximally. Carapace base color yellowish, entirely infuscate. Pedipalps base color yellowish; femur dorsal carinae infuscate, other carinae and intercarinal surfaces immaculate; patella dorsal and retrolateral carinae infuscate, retrolateral dorsal and retrolateral dorsosubmedian carinae infuscate around bases of trichobothria eb_2, esb_1, *est*, and *et*, infuscation confluent with infuscation of dorsal retrolateral carina; chela manus, retrolateral surface diffusely infuscate distally, carinae and intercarinal surfaces immaculate, fingers infuscate proximally. Legs base color yellowish, retrolateral surfaces infuscate. Coxosternal region and genital operculum immaculate, pectines faintly infuscate. Mesosoma base color yellowish, entirely infuscate; tergites I–VII dorsal median carinae immaculate, slightly infuscate on V and VI, dorsal lateral carinae infuscate on I–VII; sternites III–VII ventral surfaces immaculate medially, infuscate on lateral margins; VII lateral ventral, ventral lateral, and ventral submedian carinae infuscate around bases of macrosetae. Metasoma base color yellowish to reddish orange, becoming progressively darker posteriorly, segments IV and V darker than I–III; dorsal lateral and lateral inframedian intercarinal surfaces infuscate on I–III, immaculate on IV and V; ventral lateral and ventral submedian carinae infuscate around bases of macrosetae on I–IV; all carinae infuscate on I–IV, dorsal lateral, ventral lateral, and ventral sublateral carinae infuscate around bases of macrosetae in posterior half of V; ventral median carina immaculate on V. Telson vesicle base color yellowish orange, paler than metasomal segment V; aculeus dark reddish brown.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 15 tines, in distal half.

Carapace: Length 1.1 times greater than posterior width (table 4). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 6C). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian, posteromedian, and posterolateral sulci shallow; anterolateral and posterior transverse obsolete. Surfaces matte, uniformly finely granular.

Coxosternal region: Sternum subequilateral pentagonal; 1.7 times wider than long (table 4); median sulcus deep; ventral surfaces finely granular; with three pairs of macrosetae (fig. 9B). Coxae ventral surfaces matte. Coxa II proximal margin entirely finely granular,

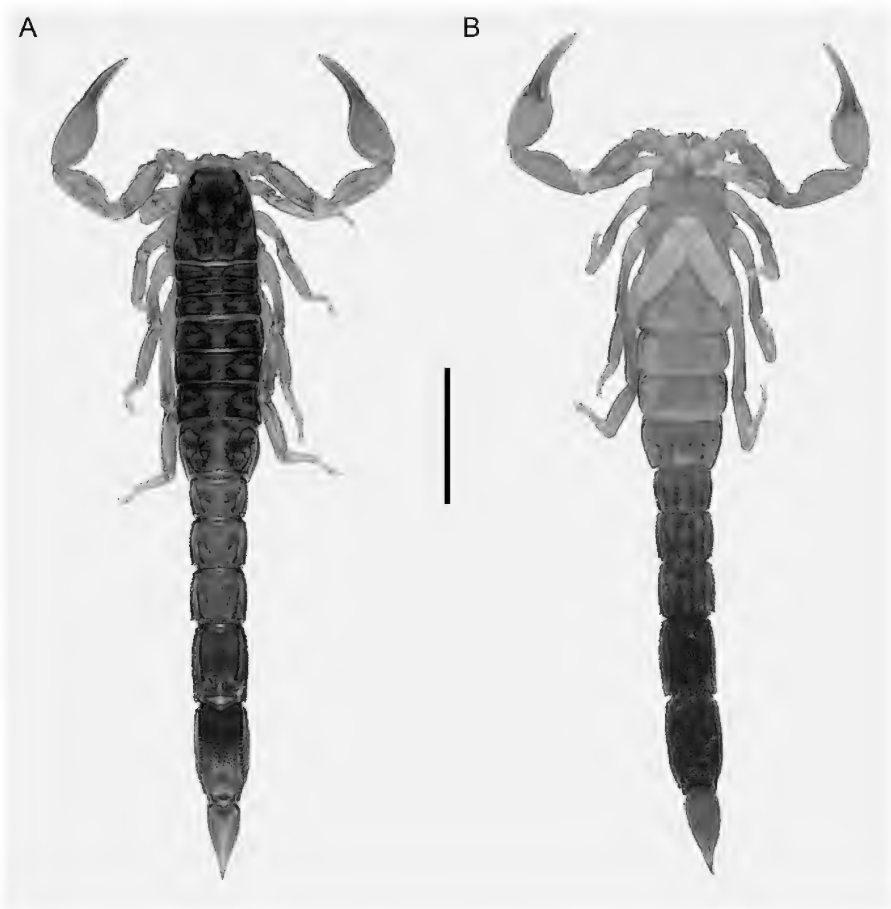

Fig. 29. *Konetontli migrus*, n. sp., habitus, holotype ♂ (CNAN T0891). **A**. Dorsal aspect. **B**. Ventral aspect. Scale bars = 2.5 mm.

subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with deep depression, medial margin finely granular. Coxa IV length 1.9 times greater than coxa II length (table 4).

Pedipalps: Femur intercarinal surfaces matte (fig. 30A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina obsolete, demarcated by three macrosetae medially; retrolateral ventral and ventral median carinae vestigial, reduced to few granules proximally; prolateral ventral carina partial, reduced to three granules, each with one macroseta, connected by fine granulation in distal quarter of segment; prolateral ventrosubmedian carina partial, restricted to proximal three-quarters of segment and reduced to spiniform granule proximally, with few smaller granules and one macroseta medially. Patella width 1.1 times greater than femur width (table 4); intercarinal surfaces matte (fig. 30B–E); dorsal prolateral and dorsal retrolateral carinae complete, granular; retrolateral dorsal, retrolateral dorsosubmedian, and ventral retrolateral carinae obsolete; ventral retrosubmedian carina obsolete; ventral prolateral carina complete, granular; ventral median carina partial, costate in proximal third; prolateral ventral carina obsolete, demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules

curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.5 times greater than patella length, 1.8 times greater than femur length (table 4); width 1.4 times greater patella width, 1.5 times greater than femur width. Manus incrassate (fig. 30F–I); intercarinal surfaces smooth; prolateral dorsal, dorsal median, dorsal retrolateral, retrolateral median, ventral submedian, ventral prosubmedian, prolateral ventral and prolateral median carinae obsolete. Fixed and movable fingers dentate margin sublinear, notches and lobes absent, small gap evident proximally when fingers closed; fixed finger median denticle row comprising six denticle subrows flanked by six prolateral and retrolateral denticles, proximal prolateral and retrolateral denticles situated in proximal quarter of finger; movable finger, median denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six retrolateral denticles, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, in proximal fifth of manus; *Dt* situated near midpoint of manus; *ib* and *it* situated subproximal on fixed finger, between sixth prolateral denticle and macroseta associated with seventh prolateral denticle (absent).

Legs: Basitarsi retrolateral dorsal, retrolateral ventral and prolateral ventral spinule rows complete on legs I and II; retrolateral dorsal row partial, restricted to distal two-thirds on III (fig. 15G), absent on IV; prolateral and retrolateral ventral rows partial, restricted to distal third on III, absent on IV; retrolateral median row vestigial, reduced to few terminal spinules on I–IV; macrosetal counts on I–IV, respectively: dorsal and retrolateral dorsal, 2:2:2:2; retrolateral ventral, 3:3:5:5; prolateral ventral, 2:3:4:4, subdistal two macrosetae spiniform on III and IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long, with three pairs of macrosetae (fig. 9B); sclerites free at posterior margin, but unable to open more than 45°; genital papillae present, protruding posteriorly (♂).

Hemispermatophore: Lamina twice length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 16K). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 16L). Hemimating plug developed from inner lobe, distal barb margin rimmed with weakly sclerotized indentation, spinules weakly developed. Inner lobe, basal plate distal to ventral trough. Distal barb length 0.3 times greater than basal plate length (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 9B). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, seven sclerites separate. Fulcra, 9–10. Pectinal teeth, 10–11. Pectines relatively long, second (medial) sclerite of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte medially, shagreened laterally (fig. 29A), dorsal median carinae complete, costate, becoming granular posteriorly, dorsal lateral carinae obsolete on I–IV, partial, restricted to posterior half, granular on V and VI; VII intercarinal surfaces shagreened, dorsal median carina complete, granular in anterior half of segment, becoming costate in posterior half, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces smooth medially, finely granular laterally (fig. 29B), spiracles minute, suboval; V ventral surface with moderately developed hyaline glandular area posteromedially; VII intercarinal surfaces smooth medially, finely granular laterally, with moderately developed hyaline glandular area posteromedially, carinae obsolete except ventral lateral carinae incomplete, occupying posteromedian aspect of the segment, granular, ventral lateral and ventral submedian carinae each with one pair of macrosetae.

Metasoma: Metasoma length 1.6 times greater than mesosoma length; segment I, width 1.6 times greater than length; II width

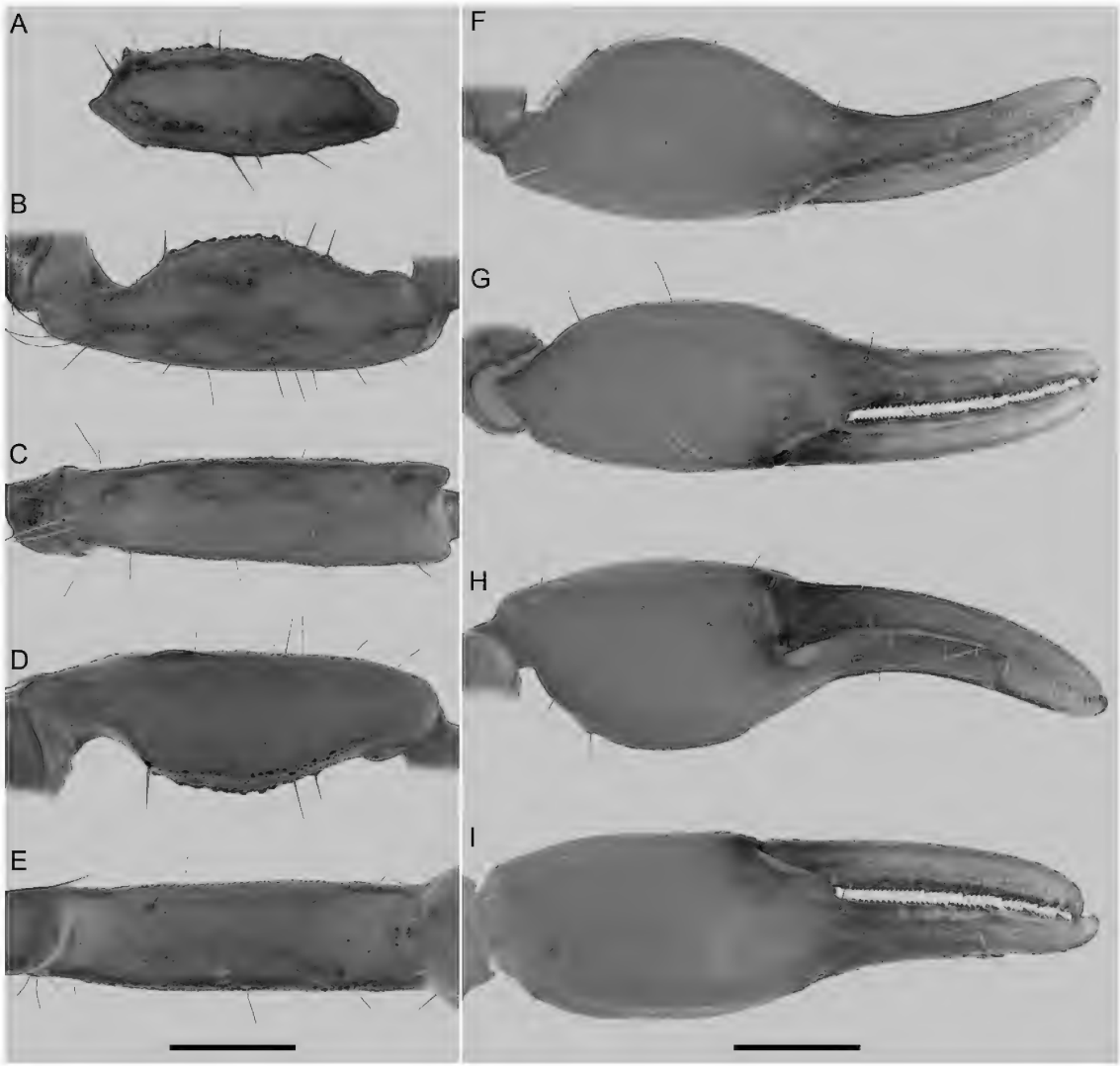

Fig. 30. *Konetontli migrus*, n. sp., holotype ♂ (CNAN T0891), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

1.3 times greater than length; III width 1.1 times greater than length; V width 1.3 times greater than telson width. Segments I–V intercarinal surfaces matte (figs. 12B, 13B); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, partial, restricted to anterior half, granular on V; lateral inframedian carinae complete, granular on I, partial, restricted to posterior third, granular on II, partial, restricted to posterior half, granular on III, absent on IV and V; ventral lateral carinae complete, granular on I–V; ventral submedian carinae obsolete, indicated only by macrosetae on I–III, partial, restricted to posterior half, granular on IV; ventral median carina obsolete, granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:1:1:1:4; lateral median carinae, 0:2:2:3:3; lateral inframedian carinae, 1:1:1:0:0; ventral

lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:1.

Telson: Vesicle elongate; length 2.1 times greater than width, 1.6 times aculeus length (table 4). Dorsal surface smooth. Ventral lateral surfaces sparsely granular; ventral sublateral carinae obsolete, each with three pairs of macrosetae and four or five pairs of microsetae; ventral median carina with four pairs of macrosetae; subaculear tubercle compound, primary tubercle blunt spiniform, laterally compressed, preceded by four smaller spiniform tubercles, the first two forming a bicuspid, preceded by a row of granules, decreasing in size anteriorly. Aculeus laterobasal microserration comprising 5–6 spinules (fig. 14G).

DISTRIBUTION: *Konetontli migrus*, sp. nov., is known only from the type locality at the northern end of the Sierra Madre del Sur, in Guerrero, Mexico (fig. 3).

ECOLOGY: The type material was collected in a transition between tropical deciduous and pine-oak forest at 796 m altitude in the foothills of the western slopes of the Sierra Madre del Sur. The habitat and habitus of *K. migrus*, sp. nov., are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

Konetontli nayarit (Armas and Martín-Frías, 2001)
Figures 3, 6D, 8C, 12C, 13C, 14H, 17A, B, 31, 32; tables 1, 3, 4

Vaejovis nayarit Armas and Martín-Frías, 2001: 13–16, fig. 2A–E, table 1; González-Santillán, 2004: 29; Francke and Ponce-Saavedra, 2005: 63, 66, figs. 8, 16, 17, 67; Soleglad and Fet, 2008: 73, 89, 100.
Konetontli nayarit (Armas and Martín-Frías, 2001): González-Santillán and Prendini, 2013: 35, 36, fig. 26C.

TYPE MATERIAL: **MEXICO: Nayarit:** *Municipio de Compostela*: Holotype ♂ (CNAN T0177), 4 km NE Felipe Carrillo Puerto [ca. 13 km NW of Compostela, 21°7.604′N 104°51.625′W, ca. 870 m], 16.vii.1999, J.A. Fernández Ibarra.

DIAGNOSIS: *Konetontli nayarit* is closely related to *K. chamelaensis*, *K. ilitchi*, sp. nov., *K. migrus*, sp. nov., and *K. pattersoni*, with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of granular ventral submedian carinae on metasomal segments I–IV, and 11 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli nayarit* is the sister species of *K. pattersoni*, with which it shares partially infuscate dorsal prolateral, dorsal retrolateral, and ventral prolateral carinae of the pedipalp femur, patella and chela, as well as complete, granular dorsal prolateral, dorsal retrolateral, ventral retrosubmedian and ventral prolateral carinae of the patella. The two species differ in the following respects. The infuscation of *K. nayarit* is dense and marbled, the metasomal carinae demarcated by continuous bands of infuscation, unlike *K. pattersoni*, in which the infuscation is sparse and mottled, the metasomal carinae demarcated by disconnected patches of infuscation. Metasomal segment IV is longer than wide in *K. nayarit*, but as wide as or slightly wider than long in *K. pattersoni*. The telson is globose, with a compound subaculear tubercle comprising a moderately enlarged, blunt primary tubercle with four or more secondary tubercles, in *K. nayarit*, but slender and elongated, with a simple, smaller and sharper subaculear tubercle, in *K. pattersoni*. The pedipalp chela fixed finger is sublinear, without a proximal notch or median lobe, the fingers fitting together evenly, such that little or no proximal gap is evident, when closed, in *K. nayarit*, whereas the fixed finger is emarginate with a proximal notch and shallow median lobe, the fingers fitting together unevenly, such that a distinct proximal gap is evident, when closed, in *K. pattersoni*.

Konetontli nayarit differs further from the other three species as follows. *Konetontli nayarit* is larger, with total length ca. 19–21 mm, than *K. chamelaensis*, *K. ilitchi*, sp. nov., and *K. migrus*, sp. nov., with total lengths ca. 11–16 mm. The pedipalp chela manus is incrassate in *K. nayarit*, but slender in *K. chamelaensis* and *K. ilitchi*, sp. nov. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. nayarit*, but five of each in *K. chamelaensis*. All pedipalp chela carinae are partially infuscate

or immaculate in *K. nayarit*, rather than markedly infuscate as in *K. ilitchi*, sp. nov. The ventral submedian carinae of metasomal segments I and II are granular in *K. nayarit*, but obsolete in *K. migrus*, sp. nov. The ventral median carina of the telson vesicle is restricted to the posterior third in *K. nayarit*, but complete in *K. migrus*, sp. nov.

DESCRIPTION: The following redescription, which is based on the holotype and additional material examined, supplements the original description by Armas and Martín-Frías (2001). The female is described for the first time.

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate proximally. Carapace base color yellow, entirely infuscate. Pedipalps base color yellow; femur and patella carinae partially infuscate, dorsal, prolateral, and retrolateral intercarinal surfaces sparsely infuscate, ventral surface immaculate; chela manus diffusely infuscate distally, dorsal prolateral, dorsal retrolateral, and ventral retrolateral carinae partially infuscate, other carinae immaculate, fingers infuscate proximally. Legs base color yellow, retrolateral surfaces infuscate. Coxosternal region, genital operculum and pectines immaculate. Mesosoma base color yellow, entirely infuscate; tergites I–VII dorsal median carinae immaculate, dorsal lateral carinae, dorsal submedian and dorsal lateral intercarinal surfaces infuscate; sternites III–VII ventral surfaces immaculate except infuscate on lateral margins and around base of macrosetae. Metasoma base color yellow to reddish orange, becoming darker posteriorly, segments IV and V darker than I–III; carinae infuscate; lateral intercarinal surfaces infuscate posteriorly on I–V, ventral submedian intercarinal surfaces entirely infuscate on III and IV. Telson vesicle base color yellowish orange, similar to metasomal segment IV, paler than V; subaculear tubercle infuscate; aculeus dark reddish brown, infuscate basally.

Chelicerae: Manus dorsal surface smooth, with three macrosetae distally, decreasing in size from dorsomedian to prolateral surface. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 14 tines, in distal half.

Carapace: Length 1.1 times greater than posterior width (table 4). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 6D). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior half of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus deep with anterior depression; posteromedian sulcus shallow anteriorly, becoming deeper posteriorly; anterolateral sulci obsolete; posterolateral and posterior transverse sulci shallow. Surfaces shagreened, mostly uniformly finely granular with few scattered coarse granules.

Coxosternal region: Sternum subequilateral pentagonal; 1.6 times wider than long (table 4); median sulcus deep; ventral surfaces finely granular; with three pairs of macrosetae (fig. 8C). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa II proximal margin smooth, subproximally with three oblique slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with shallow depression, medial margin finely granular. Coxa IV 1.91 times longer than coxa II (table 4).

Pedipalps: Femur intercarinal surfaces matte (fig. 32A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina obsolete, demarcated by two macrosetae medially; retrolateral ventral carina vestigial, reduced to few granules proximally; ventral median carinae obsolete; prolateral ventral carina partial, reduced to three spiniform granules, each with one macroseta, in proximal third of segment; prolateral ventrosubmedian carina partial, restricted to proximal half of segment and reduced to spiniform granule proximally with two or three smaller granules and two macrosetae medially. Patella width 1.3 times greater than femur width (table 4); intercarinal surfaces matte (fig. 32B–E); dorsal prolateral and dorsal retrolateral carinae complete, costate proximally, becoming costate-granular medially to distally; ventral retrosubmedian and ventral prolateral carinae

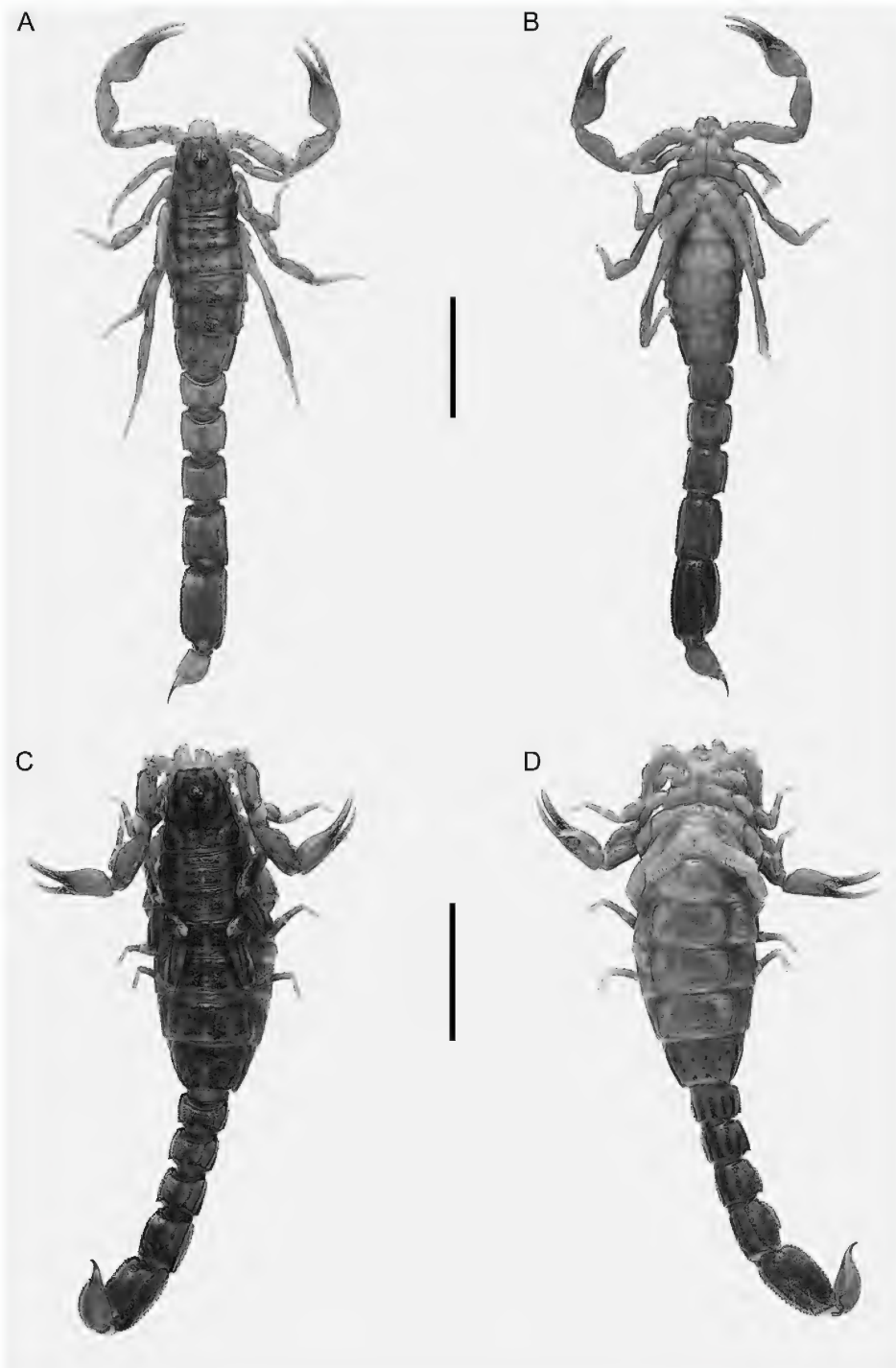

Fig. 31. *Konetontli nayarit* (Armas and Martín-Frías, 2001), habitus. **A**, **B**. Holotype ♂ (CNAN T0177). **C**, **D**. ♀ (CNAN SC3852). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 5 mm.

complete, granular; retrolateral carinae obsolete; ventral median carina partial, restricted to proximal third of segment, costate to costate-granular distally; prolateral ventral carina obsolete, demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.5 times greater than patella length, 1.8 times greater than femur length (table 4); width 1.2 times greater than patella width, 1.6 times greater than femur width. Manus incrassate (fig. 32 F–I); intercarinal surfaces smooth; all carinae obsolete, except prolateral median and ventral prolateral carinae costate. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising six denticle subrows, flanked by seven prolateral denticles (seventh without macrosetae) and six smaller retrolateral denticles, proximal two retrolateral denticles separated from subrows, proximal prolateral and retrolateral denticles situated in proximal third of finger; movable finger, median denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six smaller retrolateral denticles, proximal two retrolateral denticles separated from subrows, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, subproximal on manus; *Dt* situated in proximal half of manus; *ib* and *it* situated subproximal on fixed finger, between sixth and seventh prolateral denticles.

Legs: Basitarsi retrolateral dorsal and retrolateral ventral spinule rows complete on legs I and II; retrolateral dorsal row partial, restricted to distal half on III (fig. 15H), absent on IV; retrolateral ventral row partial, restricted to distal quarter on III, absent on IV; prolateral ventral and retrolateral median rows absent on I–IV; macrosetal counts on I–IV, respectively: dorsal, 2:2:2:2; retrolateral dorsal, 3:3:3:3; retrolateral ventral, 3:4:4:5; prolateral ventral, 3:4:4:4, median two macrosetae spiniform on III and IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 8C), with three (♂) or four (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 2.1 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 17A). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 17B). Hemimating plug developed from inner lobe, distal barb margin with approximately 10 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.4 times basal plate length (table 3).

Pectines: Basal piece with one pair of macrosetae (fig. 8C). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, seven sclerites separate. Fulcra, 12/11. Pectinal teeth, 13/13 (♂), 12/12 (♀), proximal pair half the size of others. Pectines relatively long, second (medial) sclerite (♂) or midpoint of third (distal) sclerite (♀) of marginal lamella aligned with distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte medially, shagreened laterally (fig. 31A, C), dorsal median and dorsal lateral carinae partial, restricted to posterior half of segment, costate on I–III, weakly granular anteriorly on IV–VI; VII dorsal median carina partial, restricted to anterior two-thirds of segment, costate, dorsal lateral and lateral median carinae converging posteromedially, serrate, posterior granules spiniform, slightly larger.

Sternites: Sternites III–VI surfaces finely punctate (fig. 31B, D), spiracles minute, suboval; V ventral surface with moderately developed hyaline glandular area posteromedially; VII intercarinal surfaces finely punctate, with obsolete hyaline glandular area

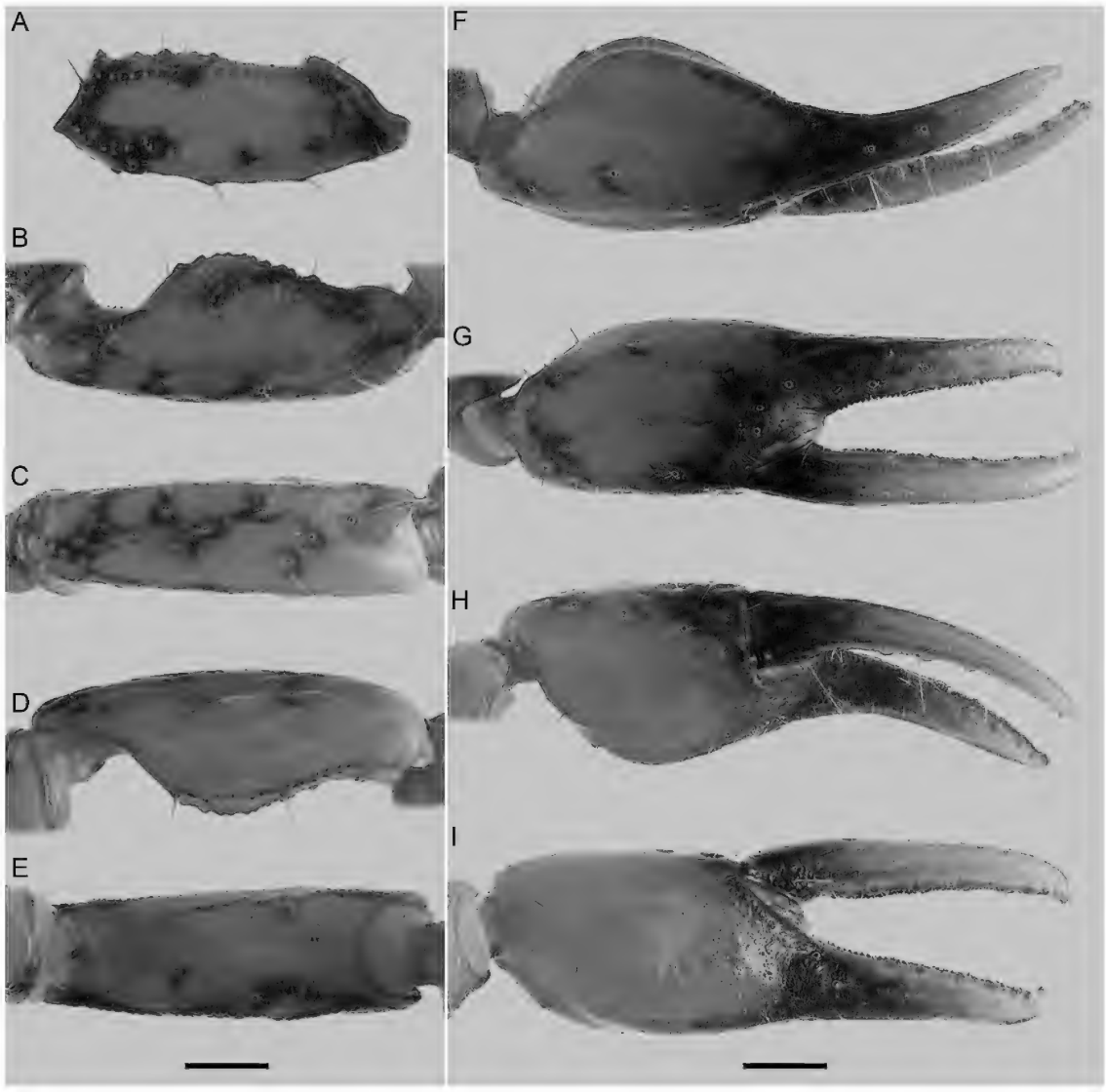

Fig. 32. *Konetontli nayarit* (Armas and Martín-Frías, 2001), holotype ♂ (CNAN T0177), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

posteromedially, carinae obsolete, lateral ventral carinae each with one pair of macrosetae, ventral lateral and ventral submedian carinae each with two pairs of macrosetae.

Metasoma: Metasoma length twice length of mesosoma; segment I width 1.5 times greater than length; II width 1.2 times greater than length; III width 1.1 times greater than length; V width 1.6 times greater than telson width. Segments I–V all intercarinal surfaces matte, except dorsal intercarinal surfaces shagreened (figs. 12C, 13C); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, partial, restricted to anterior two-thirds, costate-granular anteriorly, becoming weaker posteriorly on V;

lateral inframedian carinae complete, costate-granular on I and II, partial, restricted to posterior half, granular on III, partial, restricted to few granules posteriorly on VI, absent on V; ventral lateral carinae complete, costate-granular on I–V; ventral submedian carinae partial, costate-granular on I, complete, costate-granular on II–IV; ventral median carina complete, costate-granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:1:1:1:3; lateral median carinae, 0:1:1:2:2; lateral inframedian carinae, 0:0:0:0; ventral lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 3:3:3:3:3.

Telson: Vesicle elongate; length 2.1 times greater than width, 1.3 times aculeus length (table 4). Dorsal and lateral intercarinal surfaces smooth. Ventral surface granular, lateral median, ventral lateral, and ventral sublateral carinae partial, granular in posterior half, each with three pairs of macrosetae; ventromedian carina with four pairs of macrosetae, subaculear tubercle compound, primary tubercle blunt, preceded by partial row of four or more smaller spiniform tubercles. Aculeus laterobasal microserration comprising seven spinules (fig. 14H).

DISTRIBUTION: *Konetontli nayarit* is known from three localities at altitudes ranging from 126 to 870 mm, in the valleys and mountain ranges in the southern part of Nayarit, Mexico (fig. 3).

ECOLOGY: According to Armas and Martín-Frías (2001), the type specimens were collected in the backyard of a house, under a railway sleeper at an altitude of 850 m with a subtropical humid climate and tropical deciduous forest vegetation. Jesus María Corte, the only locality where this species was personally collected, was dominated by secondary tropical forest. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

REMARKS: Armas and Martín-Frías (2001) described this species in the genus *Vaejovis*. Sissom (2000) assigned it to the *mexicanus* group of *Vaejovis*, where it remained until it was transferred to *Konetontli* by González-Santillán and Prendini (2013).

ADDITIONAL MATERIAL: **MEXICO: Nayarit:** *Municipio de El Nayar*: Río Santiago, 16.v.1996, 1 ♀ (CNAN SC3852). *Municipio de Tepic*: Jesus María Corte, 4 km N, 2 km along gravel road E of main paved road, ca. 30 km N of Tepic, 21°45.203′N 104°51.213′W, 126 m, 29.vii.2005, E. González, R. Mercurio and S. Reynaud, collected at night with UV light, 1 ♀ (AMNH [LP 4725]).

Konetontli pattersoni (Williams and Haradon, 1980)
Figures 4, 7A, 9F, 12D, 13D, 14I, 15I, 17C, D, 33, 34; tables 1, 3, 5

Vaejovis pattersoni Williams and Haradon in Williams, 1980: 54, 65, 66, figs. 56F, 69, 75; Beutelspacher, 2000: 102, 138, 153, map 82; Lourenço and Sissom, 2000: 135, appendix 5.1; Sissom, 2000: 542; González-Santillán, 2004: 29; Francke and Ponce-Saavedra, 2005: 63, 66, 67; Sissom and Hendrixson, 2005: 127, table 6.2; Soleglad and Fet, 2008: 74, 89, 100.

Vaejovis monticola Sissom, 1989: Kovařík, 1998: 147.

Konetontli pattersoni (Williams and Haradon, 1980): González-Santillán and Prendini, 2013: 35, 36, fig. 15.

TYPE MATERIAL: **MEXICO: Baja California Sur:** Holotype ♂ (CAS, Type No. 12250), 25 ♂ and ♀ paratypes, including allotype ♀ (CAS), La Laguna, Sierra de La Laguna, 1707 m, 1–3.viii.1974, R.M. Haradon, V.F. Lee, and W.E. Savary, under bark and under rocks.

DIAGNOSIS: *Konetontli pattersoni* is closely related to *K. chamelaensis*, *K. ilitchi*, sp. nov., *K. migrus*, sp. nov., and *K. nayarit*, with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of granular ventral submedian carinae on metasomal segments I–IV, and 11 ventromedian spinules on the telotarsus of leg III (González-Santillán and Prendini, in prep.). *Konetontli pattersoni* is the sister species of *K. nayarit* with which it shares partially infuscate dorsal prolateral, dorsal retrolateral, and ventral prolateral carinae of the pedipalp femur, patella and chela, as well as complete, granular dorsal prolateral, dorsal retrolateral, ventral retrosubmedian and ventral prolateral carinae of the patella. The two species differ in the following respects. The infuscation of *K. pattersoni* is

TABLE 5

Measurements (mm) of *Konetontli pattersoni* (Williams and Haradon, 1980), Deposited at the American Museum of Natural History, New York (AMNH), and *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., Deposited at the Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (CNAN)

Species		*K. pattersoni*								*K. zihuatanejensis*					
Collection		AMNH								CNAN					
Number										T0893	SC3854	SC3854	SC3854	SC3854	SC3853
Type										Neo.					
Sex		♂	♂	♂	♂	♂	♀	♀	♀	♂	♀	♀	♀	♀	♀
Carapace	length	2.85	3.35	2.85	2.75	2.5	3.1	3.25	3.2	2.9	3.5	3.3	3.1	2.8	2.85
	ant. width	1.5	1.7	1.45	1.55	1.45	1.75	1.8	1.8	1.6	1.95	1.95	1.85	1.7	1.7
	post. width	2.4	3.05	2.55	2.55	2.35	3.15	3.25	3.2	2.75	3.45	3.3	3.2	2.9	3.15
Femur	length	2.1	2.4	2.1	2.05	1.95	2.5	2.6	2.4	2.3	2.6	2.55	2.55	2.15	2.45
	width	0.8	1.15	0.85	0.85	0.7	1.0	1.0	1.0	0.9	1.05	1.0	1.0	0.85	0.95
Patella	length	2.5	2.75	2.45	2.5	2.35	2.8	3.0	2.7	2.8	3.05	3.0	3.0	2.6	2.95
	width	1.0	1.15	1.0	0.95	0.9	1.15	1.1	1.05	1.4	1.2	1.15	1.15	1.05	1.15
Chela	length	3.9	4.25	4.0	3.75	3.5	4.25	4.6	4.25	4.3	4.65	4.7	4.65	4.05	4.35
Manus	width	1.4	1.75	1.45	1.3	1.3	1.3	1.3	1.25	1.9	1.0	1.25	1.25	1.1	1.2
Manus	height	1.2	1.65	1.25	1.25	1.15	1.15	1.15	1.15	1.1	1.15	1.15	1.1	1.0	1.0
Fixed finger	length	1.7	1.9	1.7	1.55	1.45	2.0	2.2	2.05	1.9	2.2	2.2	2.2	1.9	2.0
Mov. finger	length	2.35	2.45	2.35	2.25	2.0	2.6	2.85	2.6	2.4	2.85	2.75	2.7	2.45	2.6
Coxa II	length	1.2	1.35	1.15	1.15	1.0	1.35	1.4	1.35	1.25	1.15	1.45	1.3	1.3	1.2
	length	2.45	2.7	2.35	2.25	2.05	2.85	2.95	2.7	2.3	2.3	2.95	2.85	2.65	2.4
Sternum	length	0.55	0.65	0.55	0.5	0.5	0.55	0.65	0.55	0.65	0.65	0.75	0.7	0.6	0.65
	width	0.75	0.85	0.75	0.75	0.75	0.9	0.95	0.85	0.85	0.85	1.0	0.95	0.8	0.75
Mesosoma	length	5.5	6.25	5.7	5.3	5.3	6.55	7.8	5.7	6.4	8.4	7.65	7.8	6.35	6.95
Metasoma	length	9.75	10.4	9.6	9.4	8.3	10.35	10.85	9.7	9.6	10.75	10.2	10.0	8.75	9.7
Segment I	length	1.25	1.25	1.2	1.15	1.0	1.75	1.35	1.15	1.2	1.3	1.25	1.2	0.95	1.25
	width	2.0	1.95	1.75	1.8	1.65	2.1	2.2	2.1	2.0	2.4	2.15	2.2	1.95	2.1
	height	1.5	1.7	1.6	1.5	1.3	1.65	1.55	1.5	1.5	1.75	2.05	1.85	1.75	1.75
Segment II	length	1.5	1.6	1.5	1.45	1.25	1.5	1.65	1.5	1.5	1.65	1.5	1.5	1.25	1.45
	width	2.0	2.0	1.8	1.75	1.7	2.1	2.2	2.1	1.8	2.15	2.3	2.2	1.9	2.0
	height	1.45	1.65	1.5	1.5	1.3	1.65	1.6	1.55	1.5	1.75	2.05	1.75	1.7	1.75
Segment III	length	1.75	1.85	1.65	1.6	1.4	1.65	1.85	1.65	1.6	1.75	1.7	1.65	1.4	1.5
	width	2.1	2.05	1.85	1.85	1.75	2.1	2.25	2.1	1.8	2.2	2.25	2.3	1.9	2.0
	height	1.5	1.75	1.5	1.5	1.35	1.65	1.65	1.6	1.5	1.75	2.05	1.75	1.75	1.75
Segment IV	length	2.45	2.65	2.25	2.25	1.95	2.35	2.6	2.3	2.3	2.55	2.55	2.45	2.15	2.25
	width	2.15	2.15	1.9	1.9	1.75	2.1	2.2	2.1	1.8	2.2	2.2	2.3	1.95	2.0
	height	1.5	1.75	1.5	1.55	1.3	1.7	1.65	1.65	1.5	1.85	2.05	1.85	1.7	1.8
Segment V	length	2.8	3.05	3.0	2.95	2.7	3.1	3.4	3.1	3.0	3.5	3.2	3.2	3.0	3.25
	width	2.0	2.0	1.95	1.9	1.65	2.0	2.2	2.0	1.9	2.15	2.25	2.15	2.0	2.0
	height	1.65	1.8	1.7	1.7	1.5	1.75	1.75	1.6	1.5	1.9	2.05	1.85	1.7	1.75
Telson	length	2.85	2.95	2.8	2.7	2.95	3.05	3.2	2.85	3.0	3.15	3.1	3.1	2.6	3.05
Vesicle	length	1.9	1.9	1.85	1.7	1.9	2.0	2.05	1.8	1.9	2.15	2.25	2.05	1.75	1.95
	width	1.2	1.2	1.15	1.1	1.15	1.25	1.35	1.25	1.3	1.6	1.55	1.5	1.35	1.5
	height	0.85	0.85	0.8	0.75	0.8	0.9	1.0	0.9	1.1	1.1	1.1	1.15	1.0	1.25
Aculeus	length	0.95	1.05	0.95	1.0	1.05	1.05	1.15	1.05	1.1	1.0	0.85	1.05	0.65	1.1
Total	length	20.95	22.95	20.95	20.15	19.05	23.05	25.1	21.45	21.9	28.95	27.35	27.1	23.1	25.6

sparse and mottled, the metasomal carinae demarcated by disconnected patches of infuscation, unlike *K. nayarit*, in which the infuscation is dense and marbled, the metasomal carinae demarcated by continuous bands of infuscation. Metasomal segment IV is as wide as or slightly wider than long in *K. pattersoni*, but longer than wide in *K. nayarit*. The telson is slender and elongated, with a simple, smaller, and sharper subaculear tubercle, in *K. pattersoni*, but globose, with a compound subaculear tubercle comprising a moderately enlarged, blunt primary tubercle with four or more secondary tubercles, in *K. nayarit*. The pedipalp chela fixed finger is emarginate with a proximal notch and shallow median lobe, the fingers fitting together unevenly, such that a distinct proximal gap is evident, when closed, in *K. pattersoni*, whereas the fixed finger is sublinear, without a proximal notch or median lobe, the fingers fitting together evenly, such that little or no proximal gap is evident, when closed, in *K. nayarit*.

Konetontli pattersoni differs further from the other three species as follows. *Konetontli pattersoni* is larger, with total length ca. 19–25 mm, than *K. chamelaensis*, *K. ilitchi*, sp. nov., and *K. migrus*, sp. nov., with total lengths ca. 11–16 mm. The median denticle row of the pedipalp chela movable finger possesses six denticle subrows with six retrolateral denticles in *K. pattersoni*, but five of each in *K. chamelaensis*. The pedipalp chela carinae are partially infuscate or immaculate in *K. pattersoni*, rather than markedly infuscate, as in *K. ilitchi*, sp. nov. The chela manus is markedly infuscate distally, and the fingers markedly infuscate in *K. pattersoni*, whereas the manus is almost immaculate, the fingers faintly and diffusely infuscate in *K. migrus*, sp. nov. The telson is elongate with the ventral surface smooth in *K. pattersoni*, but globose with the ventral surface granular in *K. migrus*, sp. nov.

DESCRIPTION: The following redescription, which is based on the type material and additional material examined, supplements Williams and Haradon's (1980) original description.

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate proximally. Carapace base color yellow to orange, entirely infuscate. Pedipalps base color yellow to orange; femur and patella carinae partially infuscate, dorsal, prolateral, and retrolateral intercarinal surfaces sparsely infuscate, ventral surface immaculate; chela manus dorsal, retrolateral, and ventral carinae diffusely infuscate distally, fingers infuscate proximally. Legs base color yellow to orange, retrolateral surfaces sparsely infuscate. Coxosternal region, genital operculum, and pectines immaculate. Mesosoma base color yellow to orange, entirely infuscate; tergites I–VII dorsal median and dorsal lateral carinae infuscate; sternites III–VII ventral surfaces diffusely infuscate, more densely so on lateral margins and around bases of macrosetae. Metasoma base color yellow to orange, intercarinal surfaces sparsely infuscate; carinae infuscate. Telson vesicle base color orange, slightly paler than metasomal segments, infuscate around bases of macrosetae; aculeus dark reddish brown, infuscate basally.

Chelicerae: Manus dorsal surface smooth, with one macroseta distally. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 13 tines, in distal half.

Carapace: Length equal to posterior width (table 5). Anterior margin sublinear, without median notch; with three pairs of macrosetae (fig. 7A). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately half the size. Median ocular tubercle raised, situated in anterior third of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus deep, narrow; posteromedian sulcus shallow anteriorly, becoming deeper and narrower posteriorly; anterolateral, posterolateral, and posterior transverse sulci shallow. Surfaces mostly matte, uniformly finely granular with few scattered coarse granules.

Coxosternal region: Sternum subequilateral pentagonal; 1.6 times wider than long (table 5); median sulcus deep; ventral surfaces finely granular; with three pairs of macrosetae (fig. 9F). Coxae ventral surfaces finely granular in places (♂) or entirely smooth (♀). Coxa II proximal margin smooth, subproximally with three oblique

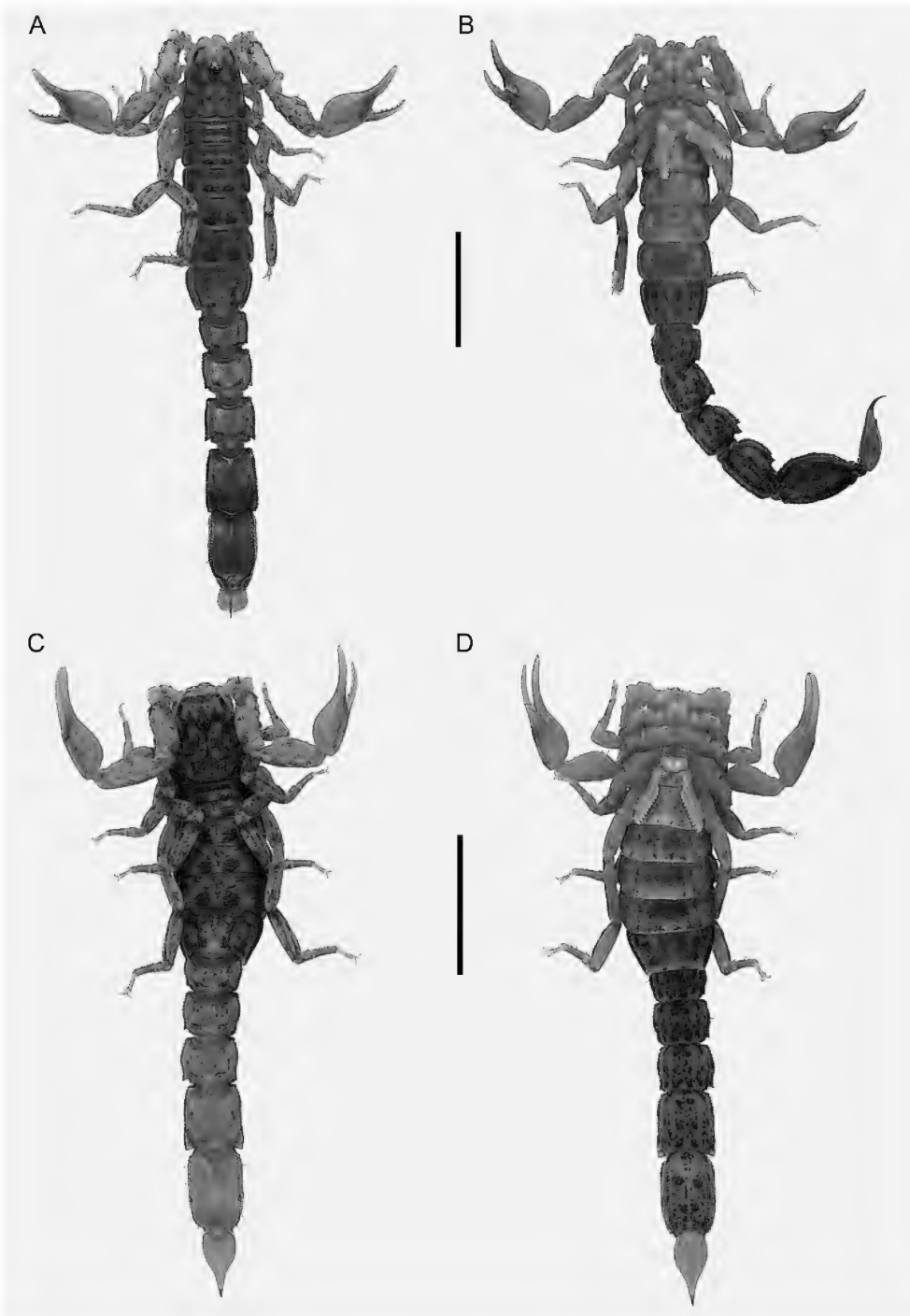

Fig. 33. *Konetontli pattersoni* (Williams and Haradon, 1980), habitus. **A**, **B**. ♂ (AMNH). **C**, **D**. ♀ (AMNH). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 5 mm.

slitlike structures, adjacent to low, smooth protuberance; coxal endite proximal margin with deep depression, medial margin finely granular. Coxa IV twice the length of coxa II (table 5).

Pedipalps: Femur dorsal, ventral and retrolateral intercarinal surfaces matte (fig. 34A), prolateral intercarinal surfaces shagreened; dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina partial, restricted to distal third, granular, with two macrosetae medially; retrolateral ventral and ventral median carinae vestigial, reduced to few granules proximally; prolateral ventral carina partial, reduced to three spiniform granules, each with one macroseta, in proximal half of segment; prolateral ventrosubmedian carina partial, restricted to proximal half of segment and reduced to spiniform granule proximally with two or three smaller granules and one macroseta medially. Patella width 1.5 times greater than femur width (table 5); intercarinal surfaces matte (fig. 34B–E); dorsal prolateral, ventral prolateral, dorsal retrolateral, and ventral retrosubmedian carinae complete, costate-granular, dorsal retrolateral and ventral retrosubmedian carinae less developed, costate proximally becoming costate-granular distally; retrolateral carinae obsolete; ventral prolateral carina complete, granular; ventral median carina partial, restricted to proximal third of segment, granular; prolateral ventral carina obsolete, demarcated by two macrosetae medially; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.6 times greater than patella length, 1.9 times greater than femur length (table 5); width equal to patella width and femur width. Manus incrassate (fig. 34F–I); surfaces smooth, acarinate. Fixed finger emarginate with proximal notch and shallow median lobe, movable finger with shallow proximal lobe, fingers fitting together unevenly, such that distinct proximal gap evident, when closed; fixed finger, median denticle row comprising six denticle subrows, flanked by six prolateral denticles and six smaller retrolateral denticles, proximal three retrolateral denticles separated from subrows, proximal prolateral and retrolateral denticles situated in proximal third of finger; movable finger, median denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six smaller retrolateral denticles, proximal three retrolateral denticles separated from subrows, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, subproximal on manus; *Dt* situated in proximal half of manus; *ib* and *it* situated proximal on fixed finger, *ib* aligned with macroseta associated with seventh prolateral denticle (absent), *it* situated between sixth prolateral denticle and macroseta associated with seventh prolateral denticle (absent).

Legs: Basitarsi retrolateral dorsal and retrolateral ventral spinule rows complete on legs I and II; retrolateral dorsal and retrolateral ventral rows partial, restricted to distal quarter on III (fig. 15I), absent on IV; prolateral ventral and retrolateral median rows absent on I–IV; macrosetal counts on I–IV, respectively: dorsal and retrolateral dorsal, 3:3:3:3; retrolateral ventral, 3:5:5:5; prolateral ventral, 4:4:4:4, median two macrosetae spiniform on III and IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum as long as wide (fig. 9F), with three (♂) or four (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina 2.4 times length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 17C). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 17D). Hemimating plug developed from inner lobe, distal barb margin rimmed with approxi-

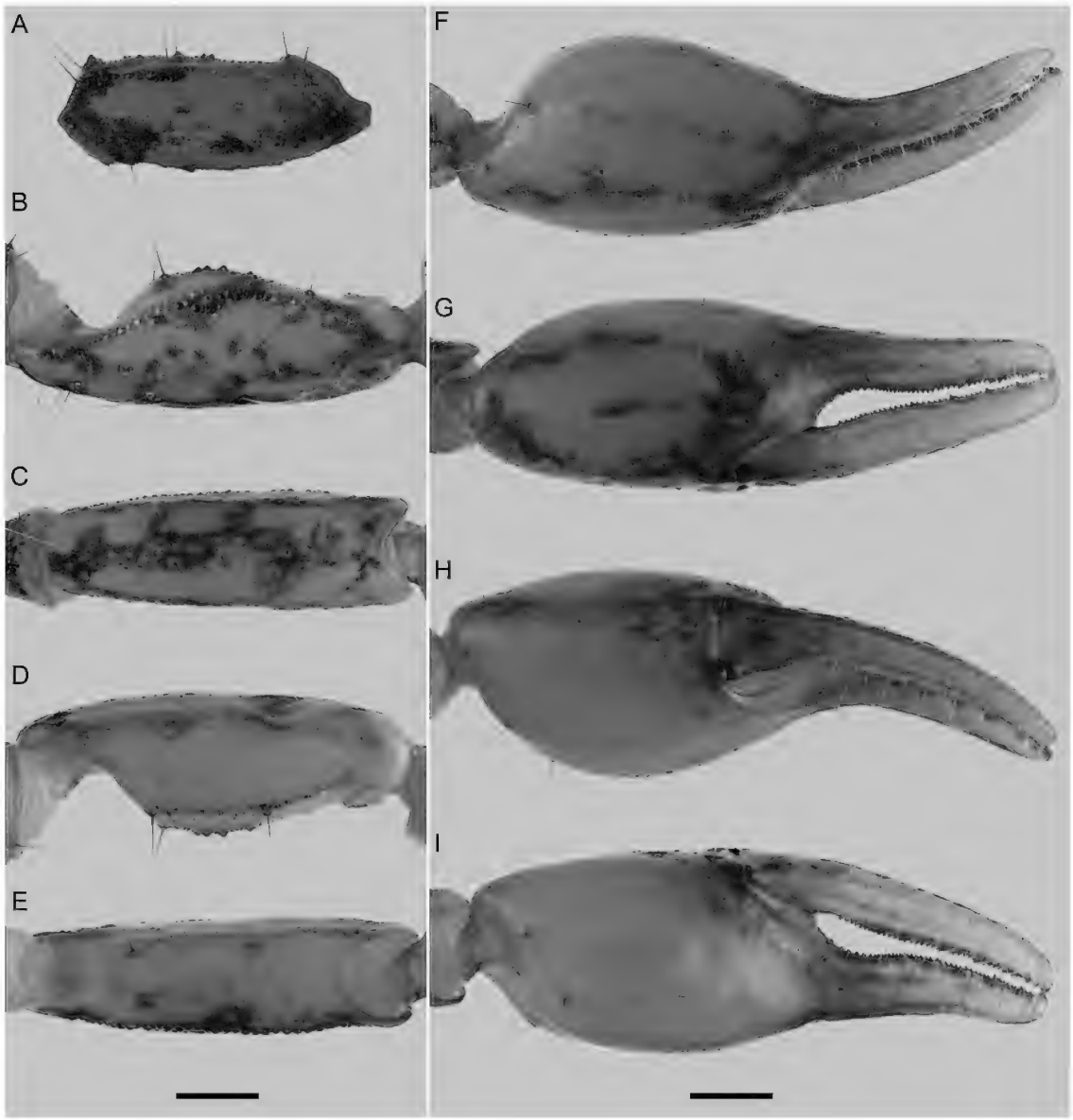

Fig. 34. *Konetontli pattersoni* (Williams and Haradon, 1980), ♂ (AMNH), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

mately 12 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb length 0.4 times basal plate length (table 3).

Pectines: Basal piece with one pair of macrosetae (fig. 9F). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, eight sclerites separate. Fulcra, 12/11. Pectinal teeth, 12–15 (♂), 11–13 (♀), proximal pair slightly smaller than others. Pectines relatively long, third (distal) sclerite of marginal lamella extending beyond (♂) or aligned with (♀) distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces matte medially, shagreened laterally (fig. 33A, C), dorsal median and dorsal lateral carinae partial, restricted to posterior half of segment, granular; VII intercarinal

surfaces shagreened, dorsal median carina partial, restricted to anterior half of segment, costate, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces finely punctate (fig. 33B, D), spiracles minute, suboval; V ventral surface with moderately developed hyaline glandular area posteromedially; VII intercarinal surfaces shagreened, with vestigial hyaline glandular area posteromedially, lateral ventral and ventral submedian carinae vestigial, each reduced to few granules and one pair of macrosetae, ventral lateral carinae weakly granular medially, each with two pairs of macrosetae.

Metasoma: Metasoma length twice length of mesosoma (table 5); segment I width 1.6 times greater than length; II width 1.5 times greater than length; III width 1.2 times greater than length; V width 1.5 times greater than telson width. Segments I–V all intercarinal surfaces matte, except dorsal intercarinal surfaces shagreened (figs. 12D, 13D); dorsal lateral carinae complete, costate-granular on I–V, terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV, partial, restricted to anterior third, granular, becoming weaker posteriorly on V; lateral inframedian carinae complete, costate-granular on I, partial, restricted to posterior half, costate-granular on II and III, absent on VI and V; ventral lateral carinae complete, costate-granular on I–V; ventral submedian carinae partial, costate-granular on I, complete, costate-granular on II–IV; ventral median carina complete, costate-granular on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:0:1:1:4; lateral median carinae, 0:1:1:2:2; lateral inframedian carinae, 1:0:0:0:0; ventral lateral carinae, 2:3:3:3:5; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 2:3:3:3:2.

Telson: Vesicle elongate; length 2.1 times greater than width, 2.7 times aculeus length (table 5). Dorsal surface smooth. Lateral intercarinal surfaces sparsely granular. Lateral median, ventral lateral, and ventral sublateral carinae smooth to weakly granular, each with three pairs of macrosetae; ventral median carina with four pairs of macrosetae, subaculear tubercle simple, conical, blunt, preceded by partial or complete row of four or more smaller spiniform tubercles, at least in posterior half. Aculeus laterobasal microserration comprising 3/3 spinules (fig. 14I).

DISTRIBUTION: *Konetontli pattersoni* is restricted to the Sierra de la Laguna in Baja California Sur, Mexico (fig. 4). The known locality records range from 782 to 1800 m altitude.

ECOLOGY: *Konetontli pattersoni* is commonly found under bark, fallen logs, and rocks in pine-oak forests of the Sierra de la Laguna. On the drier, southern slopes, where populations are less abundant and specimens generally smaller, several specimens were collected by disturbing leaf litter accumulated under palm trees. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

REMARKS: Williams and Haradon (1980) described this species in the genus *Vaejovis* and assigned it to the *eusthenura* group, where it remained until Sissom (2000) transferred it to the *mexicanus* group. It was transferred to *Konetontli* by González-Santillán and Prendini (2013).

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Baja California Sur:** *Municipio de Los Cabos*: Sierra de la Laguna, 1700 m, 30.v.2008, M. Vázquez and G. Arnaud, 1 ♂ (CNAN); Sierra de la Laguna, 23°14.285′N 109°57.131′W, 782 m, 10.vii.2004, E. González, O.F. Francke, W.E. Savary, and A. Valdez, in leaf litter accumulated under palm trees, 1 ♀ (AMNH [ARA 3082]), 23°33′01.6″N 109°59′27.4″W, 1800 m, 21.vii.2004, E. González, A. Valdez, O.F. Francke, and W.E. Savary, under bark of fallen log, 1 ♂, 1 ♀ (AMNH [LP 3150]), 1 ♀, 6 juv. (CNAN SC3148), 23°41′10″N 109°56′41.1″W, 850 m, A. Valdez and E. González, 9.vii.2004, under rocks and UV light detection at night, 1 ♀, 6 juv. (AMNH [ARA 3083]), 1 ♀ (CNAN [ARA 2128]), 3 juv. (AMNH [LP 3149]); Sierra de La Laguna, reserve nucleus zone, 23°33.016′N 109°59.450′W, 1800 m, 20.vii.2006, A. Valdez, E. González, O.F. Francke, and W.E. Savary, oak forest, under rocks, 4 ♂, 8 ♀, 8 juv. (AMNH), 2 ♂, 3 ♀ (CNAN [ARA 3064]), 1 ♂, 2 ♀ (CAS [ARA

1585]); Sierra de La Laguna, Palo Extraño, 22.x.1972, E.L. Sleeper, and F.J. Moore, 5 ♂, 18 ♀ (OSAL), 9.iii.1983, M. Vázquez, 1 juv. (CAECIB), 2.iv.1983, M. Vázquez, 2 juv. (CAECIB), 4.v.1983, M. Vázquez, 1 ♂, 2 juv. (CAECIB), 14–15.ix.1983, M. Vázquez, 2 juv. (CAECIB), 10.xi.1983, M. Vázquez, 1 juv. (CAECIB), 8–9.xii.1983, M. Vázquez, 2 juv. (CAECIB), 21–24.v.1984, M. Vázquez, 1 juv. (CAECIB), 2.viii.1984, M. Vázquez, 1 ♂, 1 juv. (CAECIB), 8.ix.1984, M. Vazquez, 2 juv. (CAECIB), 6.xii.1984, M. Vazquez, 1 juv. (CAECIB), 10.i.1985, M. Vázquez, 1 juv., 8 ex. (CAECIB), 7.ii.1985, M. Vázquez, 1 juv. (CAECIB), 2–3.iii.1985, M. Vázquez, 2 juv. (CAECIB).

Konetontli zihuatanejensis
(Baldazo-Monsivaiz, 2003), comb. nov.
Figures 3, 7B, 9D, 12E, 13E, 14J, 15J, 17E, F, 35, 36; tables 1, 3, 5

Vaejovis zihuatanejensis Baldazo-Monsivaiz, 2003: 67–71, figs. 1, 2.
Vaejovis acapulco: Francke and Ponce-Saavedra, 2005: 3, 64, 66, figs. 11, 67, figs. 18, 19.

TYPE MATERIAL: **MEXICO: Guerrero:** *Municipio de José Azueta*: Holotype ♀, paratype ♀ (UAGRO) [lost], Colonia Agua de Correa, Zihuatanejo, 24.ii.1994, J.G. Baldazo-Monsivaiz; paratype ♀ (UAGRO) [lost], Colonia la Noria, 20.viii.1994; paratype ♂ (UAGRO) [lost], Pantla, 27.iv.1991, J. Palacios S; paratype ♀ (UAGRO) [lost], Poblado Barrio Viejo, 25.iv.1995, N. Godoy Marroqui. *Municipio de La Unión*: Neotype ♂ (CNAN T0893) [here designated], La Majahua, 17°48′740″N 101°43′732″W, 6.viii.2010, J. Ponce, M. Villaseñor, A. Quijano, E. Miranda, J. Baldazo, T. Nuñez, and J. Portillo.

DIAGNOSIS: *Konetontli zihuatanejensis*, comb. nov., is closely related to *K. acapulco*, *K. ignes*, sp. nov., *K. juxtlahuaca*, sp. nov., and *K. kuarapu*, with which it forms a monophyletic group sister to the other five species of *Konetontli*, united by the presence of obsolete ventral submedian carinae on metasomal segments I–IV, and 14 ventromedian spinules on the telotarsus of leg III. *Konetontli zihuatanejensis*, comb. nov., is the sister species of *K. acapulco* with which it shares obsolete ventral submedian carinae on metasomal segments I–III and seven denticle subrows with seven retrolateral denticles in the median denticle row of the pedipalp chela movable finger. The two species differ in the following respects. The ventral submedian carinae of segment IV are partial, expressed as a short row of denticles in the posterior quarter, and the ventral lateral carinae of V complete and finely serrated, in *K. zihuatanejensis*, comb. nov., whereas the ventral submedian carinae of metasomal segment IV are obsolete and the ventral lateral carinae of V vestigial, expressed as a short row of denticles in the posterior quarter, in *K. acapulco*. The telson ventral surface is sparsely granular, with a compound subaculear tubercle, comprising primary and secondary tubercles, in *K. zihuatanejensis*, comb. nov., whereas the surface is smooth, with a simple subaculear tubercle in *K. acapulco*. The prolateral dorsal, dorsal prosubmedian, dorsal prolateral, prolateral median, and prolateral submedian carinae of the pedipalp chela are obsolete and smooth in *K. zihuatanejensis*, comb. nov., but granular in *K. acapulco*.

Konetontli zihuatanejensis, comb. nov., differs from the other three species as follows. The median denticle row of the pedipalp chela movable finger possesses seven denticle subrows with seven retrolateral denticles in *K. zihuatanejensis*, comb. nov., but six in *K. kuarapu* and *K. juxtlahuaca*, sp. nov., and five in *K. ignes*, sp. nov. The pedipalp chela manus is immaculate and incrassate in *K. zihuatanejensis*, comb. nov., whereas the chela carinae and intercarinal surfaces are markedly infuscate and the manus slender in *K. ignes*, sp. nov., and *K. juxtlahuaca*, sp. nov.

DESCRIPTION: The following redescription, which is based on the neotype and additional material examined, supplements the original description by Baldazo-Monsivaiz (2003).

Color and infuscation: Cheliceral manus dorsal surface infuscate distally, fixed and movable fingers infuscate proximally. Carapace base color yellowish orange, entirely infuscate. Pedipalps base color yellowish orange; femur dorsal, prolateral, and retrolateral intercarinal surfaces diffusely infuscate, dorsal prolateral, dorsal retrolateral, and retrolateral dorsosubmedian carinae infuscate, other carinae immaculate; patella

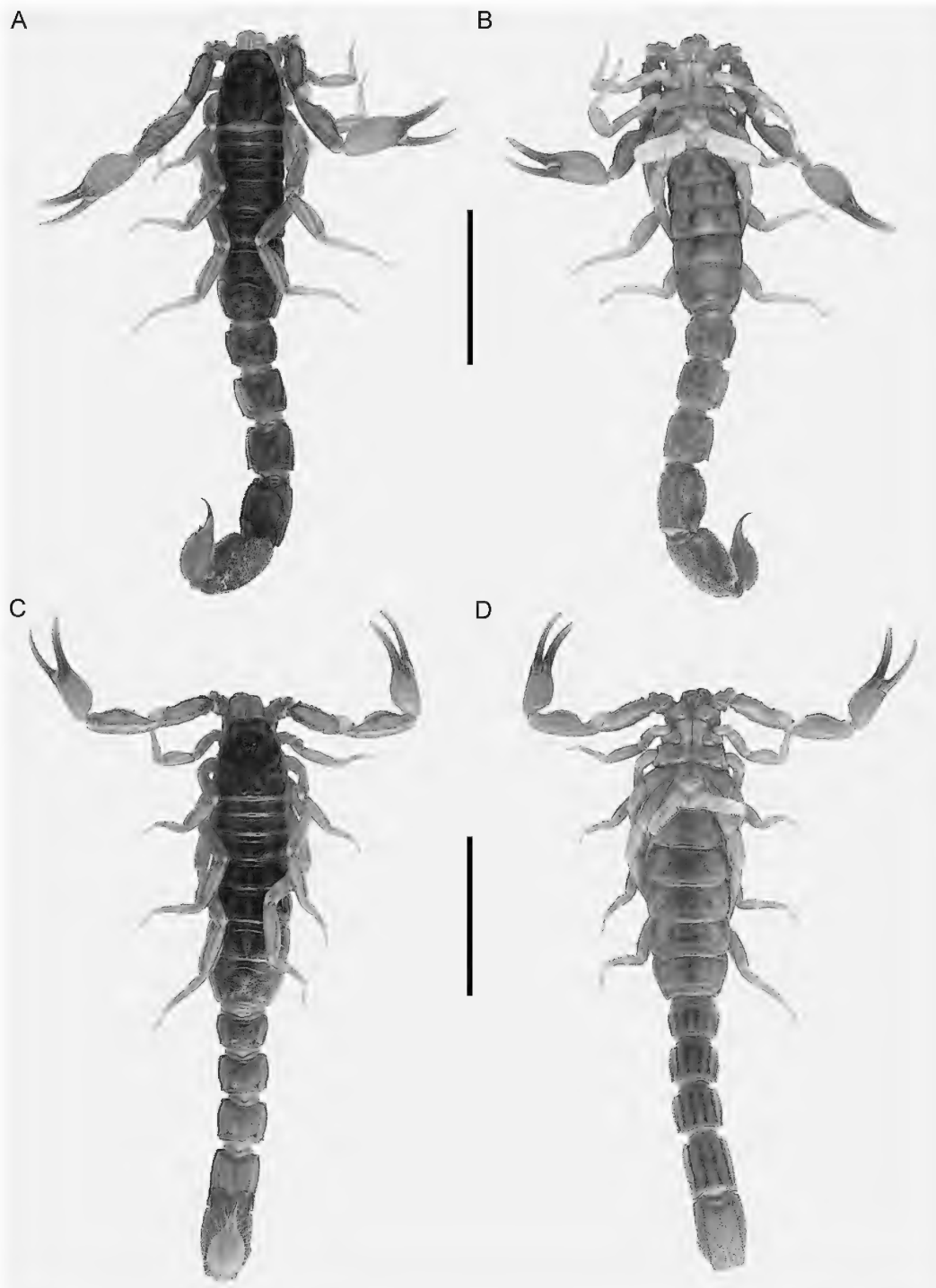

Fig. 35. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., habitus. **A**, **B**. neotype ♂ (CNAN T0893). **C**, **D**. ♀ (CNAN SC3854). **A**, **C**. Dorsal aspect. **B**, **D**. Ventral aspect. Scale bars = 5 mm.

dorsal prolateral and dorsal retrolateral carinae infuscate, dorsal and retrolateral surfaces diffusely infuscate, ventral and prolateral surfaces immaculate; chela manus diffusely infuscate distally, carinae immaculate, fingers infuscate proximally. Legs base color yellowish orange, retrolateral surfaces infuscate. Coxosternal region, genital operculum, and pectines immaculate. Mesosoma base color yellowish orange, entirely infuscate; tergites I–VII dorsal median carinae immaculate, dorsal lateral carinae and intercarinal surfaces infuscate; sternites III–VI ventral surfaces immaculate, except lateral margins infuscate, VII infuscate around bases of macrosetae. Metasoma base color yellowish orange, slightly darker than tergites, intercarinal surfaces infuscate on all segments; ventral lateral and ventral submedian carinae infuscate. Telson vesicle base color orange, paler than metasomal segments, infuscate laterally; aculeus dark reddish brown.

Chelicerae: Manus dorsal surface smooth, with one macroseta distally. Fixed and movable fingers smooth; movable finger ventral surface with serrula, comprising 18–21 tines, in distal half.

Carapace: Length 1.2 times greater than posterior width (table 5). Anterior margin sublinear, without median notch, epistome protruding slightly; with three pairs of macrosetae (fig. 7B). Three pairs of lateral ocelli, anterolateral and median lateral pairs equal in size, posterolateral pair approximately one third the size. Median ocular tubercle raised, situated in anterior third of carapace; superciliary carinae costate. Median ocelli approximately twice the size of anterolateral ocelli. Anteromedian sulcus shallow, narrow; posteromedian sulcus deep, narrow; anterolateral sulci obsolete; posterolateral sulci shallow; posterior transverse sulci obsolete. Surfaces mostly matte, uniformly finely granular with few scattered coarse granules.

Coxosternal region: Sternum subequilateral pentagonal; 1.3 times wider than long (table 5); median sulcus deep; ventral surfaces finely granular; with three pairs of macrosetae (fig. 9D). Coxae ventral surfaces finely granular. Coxa II proximal margin with three oblique slitlike structures subproximally, adjacent to low, smooth protuberance; coxal endite proximal margin with shallow depression, medial margin finely granular. Coxa IV length 1.9 times greater than coxa II length (table 5).

Pedipalps: Femur intercarinal surfaces matte (fig. 36A); dorsal prolateral, ventral prolateral, and dorsal retrolateral carinae complete, granular; retrolateral dorsosubmedian carina partial, reduced to three or four granules, and three or four macrosetae; retrolateral ventral carina obsolete; ventral median carina vestigial, reduced to few granules proximally; prolateral ventral carina partial, reduced to three spiniform granules, each with one macroseta, in proximal third of segment; prolateral ventrosubmedian carina partial, restricted to proximal half of segment and reduced to spiniform granule proximally, two or three large granules and one macroseta medially, and one macroseta distally. Patella width 2.1 times greater than femur width (table 5); intercarinal surfaces matte (fig. 36B–E); dorsal prolateral and ventral prolateral carinae complete, granular; dorsal retrolateral and ventral retrosubmedian carinae vestigial, comprising few granules proximally and distally, costate; retrolateral carinae obsolete; ventral prolateral carina complete, granular; ventral median carina vestigial, costate-granular; prolateral ventral carina obsolete, demarcated by three macrosetae proximally, medially and distally; prolateral process well developed, prolateral median carina delimited by two large granules, proximally and distally, each with a macroseta, and row of coarse granules curving toward dorsal prolateral carina in distal fifth of segment; other carinae absent. Chela length 1.5 times greater than patella length, 1.9 times greater than femur length (table 5); width 1.4 times greater patella width, 2.1 times greater than femur width. Manus incrassate (fig. 36F–I); surfaces smooth, acarinate. Fixed and movable fingers dentate margin sublinear, notches and lobes absent; fixed finger median denticle row comprising six denticle subrows, flanked by six prolateral and retrolateral denticles, proximal three retrolateral denticles separated from subrows, proximal prolateral and retrolateral denticles situated in proximal third of finger; movable finger median

denticle row comprising six denticle subrows, flanked by seven prolateral denticles and six retrolateral denticles, proximal three retrolateral denticles separated from subrows, terminal subrow comprising one denticle. Trichobothrial pattern orthobothriotaxic Type C; chela trichobothrium *Db* situated on dorsal retrolateral carina, subproximal on manus; *Dt* situated in proximal half of manus; *ib* and *it* situated proximal on fixed finger, *ib* aligned with macroseta associated with seventh prolateral denticle (absent), *it* situated between sixth prolateral denticle and macroseta associated with seventh prolateral denticle (absent).

Legs: Basitarsi retrolateral dorsal spinule row reduced to irregular, scattered spinules on legs I–IV; prolateral and retrolateral ventral spinule rows complete on I and II; retrolateral ventral row partial, restricted to distal quarter on III (fig. 15J), absent on IV; prolateral ventral row vestigial, reduced to few distal spinules on III, absent on IV; retrolateral median row absent on I–IV; macrosetal counts on I–IV, respectively: dorsal, 2:3:3:3; retrolateral dorsal, 2:2:4:4; retrolateral ventral, 4:5:5:5; prolateral ventral, 4:4:5:5, median two macrosetae spiniform on III and IV; dorsal and retrolateral dorsal macrosetae arranged in two separate parallel to subparallel rows on I–IV. Telotarsi I–IV, each with single ventromedian row of spinules, curved proximally, and one pair of ventrodistal spinules.

Genital operculum: Genital operculum wider than long (fig. 9D), with six (♂) or two (♀) pairs of macrosetae; sclerites free at posterior margin, but unable to open more than 45° (♂) or fused longitudinally (♀); genital papillae present, protruding posteriorly (♂) or absent (♀).

Hemispermatophore: Lamina twice length of trunk (table 3). Median lobe ental terminus moderately developed, rounded. Dorsal trough margin long, narrow, curving proximally, well separated from ventral trough (fig. 17E). Dorsal and ventral trough margins, terminal spinelike processes fused into prominent, bifurcate hook, situated distally on lamina dorsal margin (fig. 17F). Hemimating plug developed from inner lobe, distal barb margin rimmed with approximately 12 long spinules. Inner lobe basal plate distal to ventral trough. Distal barb half length of basal plate (table 3).

Pectines: Basal piece with three pairs of macrosetae (fig. 9D). Marginal lamella comprising three sclerites. Medial lamella proximal sclerites fused, 10–11 sclerites separate. Fulcra, 11–14. Pectinal teeth, 13–15 (♂), 12–14 (♀), proximal pair slightly smaller than others. Pectines relatively long, third (distal) sclerite of marginal lamella extending beyond (♂) or aligned with (♀) distal margin of coxa IV.

Tergites: Tergites I–VI intercarinal surfaces shagreened, lateral surfaces more coarsely so (fig. 35A, C), dorsal median carinae complete, granular, dorsal lateral carinae vestigial, reduced to few granules posteriorly; VII dorsal median carina partial, restricted to anterior half of segment, costate-granular, dorsal lateral and lateral median carinae converging posteriorly, serrate, posterior granules larger, spiniform.

Sternites: Sternites III–VI surfaces finely granular (fig. 35B, D), spiracles minute, suboval; V ventral surface with moderately developed hyaline glandular area posteromedially; VII intercarinal surfaces finely granular, with vestigial hyaline glandular area posteromedially, carinae obsolete, lateral ventral carinae each with one pair of macrosetae, ventral lateral carinae each with two pairs of macrosetae, ventral submedian carinae each with three pairs of macrosetae.

Metasoma: Metasoma length 1.5 times greater than mesosoma length (table 5); segment I width 1.7 times greater than length; II width 1.2 times greater than length; III width 1.1 times greater than length; V width 1.5 greater than telson width. Segments I–V intercarinal surfaces matte, except dorsal surfaces shagreened on I–V, ventral surfaces becoming more densely granular on V (figs. 12E, 13E); dorsal lateral carinae complete, costate-granular on I–V, granulation becoming weaker in posterior half on V, and terminating in enlarged spiniform granules posteriorly on I–IV; lateral median carinae complete, costate-granular, terminating in enlarged spiniform granules posteriorly on I–III, lobate posteriorly on IV; vestigial, reduced to spiniform granule and few smaller granules anteriorly on V; lateral inframedian

Fig. 36. *Konetontli zihuatanejensis* (Baldazo-Monsivaiz, 2003), comb. nov., neotype ♂ (CNAN T0893), dextral pedipalp femur (**A**), patella (**B–E**), and chela (**F–I**). **A**, **B**, **F**. Dorsal aspect. **C**, **G**. Retrolateral aspect. **D**, **H**. Ventral aspect. **E**, **I**. Prolateral aspect. Scale bars = 0.5 mm.

carinae complete, costate-granular on I, partial, restricted to posterior half, costate-granular on II, partial, restricted to posterior two-thirds, costate-granular on III, obsolete, reduced to scattered granules on IV, ventral lateral carinae complete, costate-granular on I–IV, finely granular anteriorly, becoming more coarsely granular posteriorly on V; ventral submedian carinae obsolete on I–III, vestigial, comprising few spiniform granules posteriorly on IV; ventral median carina obsolete on V. Macrosetal counts on carinae of I–V, respectively: dorsal lateral carinae, 0:1:1:2:4; lateral median carinae, 0:1:2:3:3; lateral inframedian carinae, 1:1:1:1:0; ventral lateral carinae, 2:3:3:3:6; ventral sublateral carinae, 0:0:0:0:2; ventral submedian carinae, 3:3:3:3:2.

Telson: Vesicle globose; length 1.6 times greater than width, 1.7 times aculeus length (table 5). Dorsal and lateral intercarinal surfaces smooth. Lateral intercarinal surfaces

sparsely granular. Lateral median and ventral sublateral carinae comprising irregular spiniform granules, each with four or five pairs of macrosetae; ventral median carina with six pairs of macrosetae, subaculear tubercle compound, primary tubercle spiniform, blunt, preceded by smaller, conical secondary tubercle situated on distal third of telson (fig. 14J). Aculeus laterobasal microserration vestigial with two small spinules, evident only in juveniles.

DISTRIBUTION: *Konetontli zihuatanejensis*, comb. nov., is known from four localities along the Pacific coast of Guerrero, Mexico, at altitudes ranging from 5 to 273 m, between Ixtapa-Zihuatanejo and La Unión, near the border with Michoacán (fig. 3).

ECOLOGY: *Konetontli zihuatanejensis*, comb. nov., was collected under stones in tropical deciduous forest. The habitat and habitus are consistent with the humicolous and lapidicolous ecomorphotypes (Prendini, 2001).

REMARKS: *Konetontli zihuatanejensis*, comb. nov., was described from one adult male and four adult female specimens deposited at UAGRO. Francke and Ponce-Saavedra (2005) reported that the types are lost and synonymized *K. zihuatanejensis*, comb. nov., with *K. acapulco*. According to J.G. Baldazo-Monsivaiz (personal commun.), the type material was accidentally destroyed. Based on morphological examination of new material reported here, and analysis of quantitative and qualitative morphological characters, we hereby revalidate *K. zihuatanejensis*, comb. nov., and designate a neotype for the species.

ADDITIONAL MATERIAL EXAMINED: **MEXICO: Guerrero:** *Municipio de Ciudad Altamirano*: Zihuatanejo–Ciudad Altamirano junction, 18.3 km NE, 17°46.850′N 101°28.730′W, 273 m, 2.viii.2008, O.F. Francke, J. Ponce, H. Montaño, and A. Quijano, 1 ♀ (CNAN SC3853). *Municipio de La Unión*: La Majahua, 17°48′740″N 101°43′732″W, 6.viii.2010, J. Ponce, M. Villaseñor, A. Quijano, E. Miranda, J. Baldazo, T. Nuñez, and J. Portillo, 4 ♀, 2 juv. (CNAN SC3854); Troncones, 17°46.856′N 101°43.192′W, 5 m, 1.viii.2008, O.F. Francke, J. Ponce, H. Montaño, and A. Quijano, 1 ♂, 1 ♀ (AMNH [ARA 2805]), 1 ♂ [leg] (AMNH [LP 11041]). *Municipio de Zihuatanejo*: Agua de Correa [17°38.963′N 101°31.616′W], 28.v. 1997, J. Baldazo-Monsivaiz, 1 ♀ (CNAN SC3860).

ACKNOWLEDGMENTS

This research was funded by two grants from the Theodore Roosevelt Memorial Fund of the AMNH to E.G.-S., and by U.S. National Science Foundation grants DEB 0413453 and DEB 0640219, and a grant from the Richard Lounsbery Foundation to L.P. E.G.-S. was supported in part by U.S. National Science Foundation grant DEB 0413453, a City University of New York (CUNY) Graduate Center Dissertation Fellowship, and fellowship 167137/304429 from the Consejo Nacional de Ciencia y Tecnología (CONACYT), Mexico. We thank María Luisa Jiménez Jiménez and Carlos Palacios Cardel (CAECIB), Charles Griswold and Anthea Carmichael (CAS), Oscar F. Francke and Griselda Montiel-Parra (CNAN), and Hans Klompen (OSAL) for lending type and nontype material from the collections in their care; José G. Baldazo-Monsivaiz, Jesus A. Ballesteros, Ernesto Barrera, Stephen H. Bullok, Jose Luis Castelo, L. Escalante, Oscar Francke, José A. Ibarra, N. Martigera, Randy Mercurio, Erwin Miranda, Hector Montaño, Timoteo Núñez, Noe Pérez, Javier Ponce-Saavedra, Juan Portillo, Ana Quijano, Sergio Reynaud, Carlos Santibáñez-López, Warren E. Savary, Alejandro Valdez, and M. Villaseñor for donating material and/or assisting with fieldwork; Ofelia Delgado-Hernández, Jeremy Huff, and Randy Mercurio for other logistical support and assistance; Ofelia Delgado-Hernández for producing illustrations; Steve Thurston for preparing the plates; and Ricardo Botero-Trujillo and an anonymous reviewer for detailed comments on a previous draft of the manuscript. Fieldwork in Mexico was conducted under permits issued by the Dirección General de Vida Silvestre (SEMARNAT) to Oscar F. Francke (FAUT-0175), whom we also thank for assistance with export logistics from Mexico. Additionally, E.G.-S. thanks Tila M. Pérez Ortíz (CNAN) and Fernando Álvarez Padilla (Facultad de Ciencias, UNAM) for access to their laboratory where

part of the manuscript was completed, and Ofelia Delgado-Hernandez for care and emotional support.

REFERENCES

Armas, L.F. de. 2003. On two enigmatic organisms associated with some Antillean and Mexican scorpions (Arachnida: Scorpionida). Revista Iberica de Aracnología 7: 239–240.

Armas, L.F. de, and E. Martín-Frías. 2001. Dos nuevos *Vaejovis* (Scorpiones: Vaejovidae) de Guerrero y Nayarit, México. Solenodon 1: 8–16.

Baldazo-Monsivaiz, J.G. 2003. *Vaejovis zihuatanejensis*, nueva especie de alacrán del Estado de Guerrero, México (Scorpiones: Vaejovidae). Entomología Mexicana 2: 67–72.

Baldazo-Monsivaiz, J.G., J. Ponce-Saavedra, and M. Flores-Moreno. 2012. Los alacranes (Arachnida: Scorpionida) de importancia médica del estado de Guerrero, México. Dugesiana 19: 143–150.

Baldazo-Monsivaiz, J.G., J. Ponce-Saavedra, and M. Flores-Moreno. 2013. Una especie nueva de alacrán del género *Centruroides* de importancia médica (Scorpiones: Buthidae) del estado de Guerrero, México. Revista Mexicana de Biodiversidad 84: 100–116.

Beutelspacher, C.R. 2000. Catálogo de los Alacranes de México. Morelia, Michoacan: Universidad Michoacana de San Nicolas de Hidalgo. 175 pp.

Francke, O.F., and J. Ponce-Saavedra. 2005. A new *Vaejovis* (Scorpiones: Vaejovidae) with a subaculear tooth from Michoacán, Mexico. Revista Ibérica de Aracnología 12: 63–68.

González-Santillán, E. 2004. Diversidad, taxonomía y hábitat de alacranes. *In* A.N. García and R. Ayala (editors), Artrópodos de Chamela: 25–35. D.F., Mexico: Instituto de Biología, UNAM.

González-Santillán, E., and L. Prendini. 2013. Redefinition and generic revision of the North American vaejovid scorpion subfamily Syntropinae Kraepelin, 1905, with descriptions of six new genera. Bulletin of the American Museum of Natural History 382: 1–71.

González-Santillán, E., and L. Prendini. 2015. Phylogeny of the North American vaejovid subfamily Syntropinae Kraepelin, 1905, based on morphology, mitochondrial and nuclear DNA. Cladistics 31 (4): 341–405.

Graham, M.R., and R.W. Bryson, Jr. 2010. *Vaejovis montanus* (Scorpiones: Vaejovidae), a new species from the Sierra Madre Occidental of Mexico. Journal of Arachnology 38: 285–293.

Graham, M.R., and V. Fet. 2006. Serrula in retrospect: A historical look at scorpion literature (Scorpiones: Orthosterni). Euscorpius 48: 1–19.

Haradon, R.M. 1974. *Vaejovis spicatus:* A new scorpion from California (Scorpionida: Vaejovidae). Pan-Pacific Entomologist 50: 23–27.

Hughes, G.B., 2011. Morphological analysis of montane scorpions of the genus *Vaejovis* (Scorpiones: Vaejovidae) in Arizona with diagnosis and description of a new species. Journal of Arachnology 39: 420–438.

Kovařík, F. 1998. Štíři (Scorpiones). Jihlava, Czech Republic: Publishing House Madagaskar. 175 pp. [in Czech]

Lourenço, W.R., and W.D. Sissom. 2000. Scorpiones. *In* J.E. Llorente Bousquets, E. González-Soriano, and N. Papavero (editors), Biodiversidad, taxonomía y biogeografía de artrópodos de México: Hacia una síntesis de su conocimiento, vol. 2: 115–135. D.F., Mexico: UNAM

Ponce-Saavedra, J., and O.F. Francke. 2011. Nueva especie de alacrán del género *Centruroides* (Scorpiones, Buthidae) del estado de Jalisco, México. Revista Mexicana de Biodiversidad 82: 465–474.

Prendini, L. 2000. Phylogeny and classification of the superfamily Scorpionoidea Latreille 1802 (Chelicerata, Scorpiones): An exemplar approach. Cladistics 15: 1–78.

Prendini, L. 2001. Substratum specialization and speciation in southern African scorpions: The Effect Hypothesis revisited. *In* V. Fet P.A. Selden (editors), Scorpions 2001. In Memoriam Gary A. Polis: 113–139. Burnham Beeches, UK: British Arachnological Society.

Rios, N.E., and H.L. Bart. 2010. GEOLocate (Version 3.22). [Computer software] Belle Chasse, LA: Tulane University Museum of Natural History.

Rzedowski, J. 1978. Vegetación de México. D.F., México: Limusa Editorial, 432 pp.

Santibañez-López, C.E., and O.F. Francke. 2010. New and poorly known species of the *mexicanus* group of the genus *Vaejovis* (Scorpiones: Vaejovidae) from Oaxaca, Mexico. Journal of Arachnology 38: 555–571.

Sissom, W.D. 1989. Systematic studies on *Vaejovis granulatus* Pocock and *Vaejovis pusillus* Pocock, with descriptions of six new related species (Scorpiones, Vaejovidae). Revue Arachnologique 8: 131–157.

Sissom, W.D. 1990. Systematics, biogeography and paleontology. *In* G.A. Polis (editor), The biology of scorpions: 31–80. Stanford, CA: Stanford University Press.

Sissom, W.D. 1993. A new species of *Vaejovis* (Scorpiones, Vaejovidae) from western Arizona, with supplemental notes on the male of *Vaejovis*

spicatus Haradon. Journal of Arachnology 21: 64–68.

Sissom, W.D. 2000. Family Vaejovidae Thorell, 1876. *In* V. Fet, W.D. Sissom, G. Lowe, and M.E. Braunwalder, Catalog of the scorpions of the world (1758–1998): 503–553. New York: New York Entomological Society.

Sissom, W.D., and B.E. Hendrixson. 2005. Scorpion diversity and patterns of endemism in northern Mexico. *In* J.-L. Cartron, E.C. Ceballos, and R.S. Felger (editors), Biodiversity, ecosystems, and conservation in northern Mexico 122–137. New York: Oxford University Press.

Sissom, W.D., and S.A. Stockwell. 1991. The genus *Serradigitus* in Sonora, Mexico, with descriptions of four new species (Scorpiones, Vaejovidae). Insecta Mundi 5: 197–214.

Sissom, W.D., G.A. Polis, and D.D. Watt. 1990. Field and laboratory methods. *In* G.A. Polis (editor), The biology of scorpions: 215–221, Stanford, CA: Stanford University Press.

Soleglad, M.E., and V. Fet. 2008. Contributions to scorpion systematics. III. Subfamilies Smeringurinae and Syntropinae (Scorpiones: Vaejovidae). Euscorpius 71: 1–115.

Volschenk, E.S., and L. Prendini. 2008. *Aops oncodactylus* gen. et sp. nov., the first troglobitic urodacid (Urodacidae: Scorpiones) with a reassessment of cavernicolous, troglobitic, and troglomorphic scorpions. Invertebrate Systematics 22: 235–257.

Webber, M.M., M.R. Graham, and J.R. Jaeger. 2012. *Wernerius inyoensis*, an elusive new scorpion from the Inyo Mountains of California (Scorpiones, Vaejovidae). ZooKeys 177: 1–13.

Williams, S.C. 1970a. New scorpions belonging to the eusthenura group of *Vejovis* from Baja California, Mexico (Scorpionida: Vejovidae). Proceedings of the California Academy of Sciences 37: 395–417.

Williams, S.C. 1970b. Scorpion fauna of Baja California, Mexico: Eleven new species of *Vejovis* (Scorpionida: Vejovidae). Proceedings of the California Academy of Sciences 31: 275–332.

Williams, S.C. 1980. Scorpions of Baja California, Mexico and adjacent islands. Occasional Papers of the California Academy of Sciences 135: 1–127.

Williams, S.C. 1986. A new species of *Vaejovis* from Jalisco, Mexico (Scorpiones: Vaejovidae). Pan-Pacific Entomologist 62: 355–358.